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RAPID ASSESSMENT REPORT FOR SITE 25 BUILDING 1346 ZONE F CNC CHARLESTON SC

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TETRA TECH INC

Rapid Assessment Report for Site 25, Building 1346

Zone F Charleston Naval Complex

North Charleston, South Carolina

Southern Division
Naval Facilities Engineering Command
Contract Number N62467-94-D-0888
Contract Task Order 0097

January 2000

RAPID ASSESSMENT REPORT
AT
SITE 25, BUILDING 1346

ZONE F, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, South Carolina 29406

Submitted by:
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CERTIFICATION PAGE

I certify that the information contained in this report and on any attachments is true, accurate, and complete to the best of my knowledge, information, and belief.

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EXECUTIVE SUMMARY

Tetra Tech NUS, Inc. (TtNUS) has completed additional assessment activities requested by the South Carolina Department of Health and Environmental Control (SCDHEC) for Site 25 (Site Identification Number 01782) of Zone F, at the former Charleston Naval Complex (CNC), located in North Charleston, South Carolina. The site includes eight abandoned underground storage tanks (UST) located at Building 1346. The USTs provided retail gasoline to vehicles on-base since the mid-1960s and were abandoned in place from 1976 to 1991. Three new fiberglass tanks, installed in 1991, are currently being used at the site. The assessment was performed under the direction of SCDHEC Rapid Assessment (RA) guidance dated June 20, 1997, and Rapid Assessment Plan approval letter dated May 5, 1998.

In addition, SCDHEC reviewed the *Report of Findings, Vacuum Truck Extraction, Interim Corrective Action Pilot Test*, prepared by S&ME, Inc., dated May 21, 1998, and recommended "additional assessment activities to evaluate intrinsic remediation as the corrective action alternative for this site."

TtNUS has completed the additional assessment activities and has used the RA reporting format to describe the results. In addition, a Tier 1 and Tier 2 Evaluation was performed for the chemicals of concern (CoC) in soil and groundwater detected at the site in excess of the Risk-Based Screening Levels (RBSL). The risk evaluations followed the guidance set forth in the *SCDHEC Risk-Based Corrective Action (RBCA) for Petroleum Releases*, dated January 5, 1998.

TtNUS performed the following actions during the assessment:

- Reviewed *Zone F, RCRA Facility Investigation Report, Charleston Naval Complex*, (E&A/H, 1996) to identify potential sources and receptors for petroleum hydrocarbons in the vicinity, to evaluate public and private potable wells, to locate utility line areas, to locate nearby surface water bodies, and to determine surface hydrology and drainage.
- Reviewed previously prepared reports by Westinghouse Environmental and Geotechnical Services, Inc., and S&ME, Inc., on site activities dating from August 1991 to May 1998.
- Conducted site survey to identify utilities and to construct a site plan.
- Installed 28 soil borings to depths ranging from 4 to 12 feet below land surface (bls) using direct push technology (DPT).
- Collected soil samples for field screening using an organic vapor analyzer.

- Installed five temporary piezometers.
- Collected soil and groundwater samples from DPT borings for on-site mobile laboratory screening analysis for benzene, toluene, ethylbenzene, and total xylenes (BTEX); naphthalene; and diesel range organics.
- Collected and analyzed nine confirmation soil samples at a fixed-base analytical laboratory for BTEX and naphthalene using U.S. Environmental Protection Agency (USEPA) Method 8260, and polynuclear aromatic hydrocarbons (PAHs) using USEPA Method 8270.
- Collected and analyzed one soil sample from one soil boring for total organic carbon using USEPA Method 415.1 and total recoverable petroleum hydrocarbons using USEPA Method 9071.
- Collected and analyzed two soil samples from one soil boring for grain size analysis using sieve and hydrometer methods.
- Collected groundwater samples from nine existing permanent monitoring wells for laboratory analysis at a fixed-base analytical laboratory.
- Collected groundwater samples from three wells for natural attenuation parameters.
- Analyzed groundwater samples for BTEX, methyl tert-butyl ether (MTBE) and naphthalene using USEPA Method 8260; PAHs using USEPA Method 8270; and lead using USEPA Method 3030.
- Collected depth to groundwater measurements to evaluate the groundwater flow direction.

Conclusions

Nine soil samples were collected on July 7, 1999, and were analyzed for BTEX and PAHs by a fixed-base laboratory. Benzene concentrations exceeded RBSLs for sandy soils where groundwater depths are less than 5 feet below ground surface in all site borings except one; concentrations ranged from 6 parts per billion (ppb) to 120,000 ppb. Total naphthalene concentrations were detected above RBSL in four boring locations; concentrations ranged from 18, 000 ppb to 217, 900 ppb.

One groundwater sampling event was conducted in September 1999. Nine existing monitoring wells were sampled. BTEX, naphthalene, and MTBE constituents were detected above RBSLs in one monitoring well (CNC25-M05). In addition, the concentration of MTBE exceeded the RBSL at wells CNC25-M06 and 609004.

Tier 1 Evaluation

A site conceptual model identified one possible receptor with five pathways present for Site 25:

1. A construction worker in a utility trench ingesting subsurface soil and/or having dermal contact with impacted subsurface soil.
2. A construction worker in a utility trench who might ingest, have dermal contact with contaminated groundwater, and/or inhale petroleum hydrocarbon vapors emitted from groundwater.

Tier 2 Evaluation

The maximum soil concentrations of all CoCs were compared against the RBSL values for the construction worker exposed by dermal contact or incidental ingestion. Soil concentrations do not exceed the RBSLs for any of the CoCs; therefore, the construction worker ingesting or contacting impacted soil was not considered further.

The soil leachability model was used to calculate site-specific target levels (SSTLs) for the establishment of soil cleanup criteria. Benzene and naphthalene concentrations in the onsite, subsurface soil exceeded the calculated SSTLs for a construction worker in a utility trench.

Groundwater RBSLs were calculated for the additional pathways of dermal contact, incidental ingestion, and inhalation of volatiles by a construction worker in contact with shallow groundwater. The minimum RBSL for each CoC (regardless of the pathway) was used to compare to site groundwater data. Concentrations of benzene, toluene, and MTBE from MW-05 exceeded the selected minimum RBSLs. Therefore, remedial action is required at the site to protect the construction worker in the utility trench.

Recommendations for Further Action

Corrective action is required at Site 25. The representative concentrations of CoCs in groundwater are above the selected minimum RBSLs calculated for a construction worker. In addition, the SSTLs for soil leaching to groundwater are exceeded. Therefore corrective action is necessary. The goal of corrective action is to prevent an impact to the identified potential receptor (the construction worker in an onsite utility trench).

1.0 INTRODUCTION

Site 25 is located adjacent to Building 1346 at the intersection of Enterprise Avenue and Borie Street on the former Charleston Naval Complex (CNC), Zone F in North Charleston, South Carolina. The site functioned as a gasoline station since the mid-1960s providing gasoline for private and government vehicles. Initial evidence that a release occurred at the site was discovered in 1991 during the closure of an underground storage tank (UST) system on-site.

This Rapid Assessment (RA) was performed by Tetra Tech NUS, Inc. (TtNUS) located at 1401 Oven Park Drive, Suite 102, Tallahassee, Florida, 32308 (telephone number 850-385-9899). The assessment was performed on behalf of the U.S. Navy Southern Division (SOUTHDIV) Naval Facilities Engineering Command (NAVFAC), 2155 Eagle Drive, North Charleston, South Carolina 29406 (telephone number 843-820-7307). Authorization to conduct the assessment for the site was issued by NAVFAC under Contract Task Order (CTO) 0097. The assessment was performed under the direction of the South Carolina Department of Health and Environmental Control (SCDHEC) Rapid Assessment Plan approval letter dated May 5, 1998. Fieldwork necessary to complete the assessment was performed June 5, 1999, through September 21, 1999, by TtNUS.

1.1 SITE DESCRIPTION

The CNC is in the city of North Charleston, on the western bank of the Cooper River in Charleston County, South Carolina (Figure 1). The installation consists of two major areas: an undeveloped dredge materials area on the eastern bank of the Cooper River on Daniel Island in Berkley County and a developed area on the western bank of the Cooper River. The developed portion of the base is on a peninsula bounded to the west by the Ashley River and to the east by the Cooper River. The site is located within the developed portion of the base.

The area surrounding CNC is "mature urban," having been developed with commercial, industrial, and residential land use for many years. Commercial areas are primarily west of CNC; industrial areas are primarily to the north of the base along Shipyard Creek. A site vicinity map, which exhibits adjacent properties and structures, vicinity roads, current utilities, and vicinity surface drainage, is included as Figure 2. The subject site was a former naval exchange retail gasoline facility that had eight USTs buried onsite and later abandoned in place.

Presently the site contains eight abandoned in place USTs, three active USTs, one structure (Building 1346), and a canopy covering the current and former dispensing locations (Figure 3). Recreational baseball and football fields are located immediately adjacent to the site on the northeast, east, and south sides, a school (unknown building number) is located to the southwest (approximately 300 feet away from the tank area), and buildings to the northwest. A second school is located approximately 600 feet to the northeast (Building 199).

According to the Initial Site Characterization prepared in 1991 by Westinghouse Environmental Services, the first USTs installed consisted of four 4,000-gallon steel USTs with steel piping located within the same tank basin and one 10,000-gallon steel UST located separately. The tanks, all used for gasoline, were listed as 1346-D, -E, -F, -G, and -H. The tanks were abandoned in place around 1978.

The site was retrofitted with three 10,000-gallon steel tanks (1346-A, -B, and -C), during the period 1977 to 1981. These tanks were taken out of operation in February 1991 following a failed tank tightness test. As a result, three new 10,000-gallon fiberglass tanks with single-walled fiberglass piping were installed in 1991 (Tanks 1346-I, -J, and -K). These tanks are currently being used by SEG Fleet Maintenance, a trucking company. The USTs at the site contained various grades of unleaded gasoline, regular unleaded, unleaded plus, and super unleaded. The site is currently active. The following table summarizes the USTs at Site 25.

UST I.D.	Installed Date	Taken Out of Service Date	Type	Size (gallons)	Contents
1346-D	1960s	~1978	Steel	4,000	Gasoline
1346-E	1960s	~1978	Steel	4,000	Gasoline
1346-F	1960s	~1978	Steel	4,000	Gasoline
1346-G	1960s	~1978	Steel	4,000	Gasoline
1346-H	1960s	~1978	Steel	10,000	Gasoline
1346-A	1970s	1991	Steel	10,000	Gasoline
1346-B	1970s	1991	Steel	10,000	Gasoline
1346-C	1970s	1991	Steel	10,000	Gasoline
1346-I	1991	Active	Fiberglass	10,000	Gasoline
1346-J	1991	Active	Fiberglass	10,000	Gasoline
1346-K	1991	Active	Fiberglass	10,000	Gasoline

1.2 SITE HISTORY

In 1901, the U.S. Navy acquired 2,250 acres near Charleston to build a shipyard and the first naval officer was assigned duty in early 1902. Subsequently, buildings and a dry dock were constructed in the Naval Yard. The dry dock was completed in 1909 along with several other brick buildings and the main power plant, which is still in operation today. The first ship was placed in dry dock and work began on fleet vessels in 1910. World War I brought about an expansion of the yards, facilities, land area, and work force. The yard built two gunboats, several submarine chasers, and tugs in addition to performing repairs and other services to the fleet. In 1933, building activity had increased principally in construction of several Coast Guard tugs, a Coast Guard cutter, and a Navy gunboat, creating the need for more facilities and a much larger work force. In 1943 civilian work force peaked with almost 26,000 employees divided among three daily shifts. In 1956, construction began on piers, barracks, and buildings for mine warfare ships and personnel. Later in the decade, the facility became a major home port for combat ships and submarines of the U.S. Atlantic Fleet [EnSafe/Allan & Hoshall, Inc.(E/A&H), 1996].

In 1993, major cuts in defense spending, as a result in part to the end of the Cold War, caused CNC to be added to the list of bases scheduled for closure under the Defense Base Realignment and Closure Act (BRAC). BRAC regulates the closure and transition of property back to the community (E/A&H, 1996). With the scheduled closure of the base, operations were scaled back and environmental cleanup proceeded to make the property available for redevelopment after closure.

1.3 RECEPTOR SURVEY RESULTS

A survey of the site vicinity was conducted by TtNUS personnel to identify potential receptors for petroleum hydrocarbon contamination. The site plan (Figure 2) depicts all known utilities located within 250 feet of the Building 1346 location. According to facility personnel, utility lines are typically located 2 to 6 feet below land surface (bls) (SPORTENVDETCHASN, 1999). The following utility receptors were located within a 250-foot radius of Building 1346.

- A water line is located at the northeast boundary of the site along South Avenue B and along the southeast side along Borie Street. The water line located between the canopy and Borie Street is approximately 50 feet southeast of the canopy and divides the area where UST basins are located. In addition, the line transects the free product interception trench located on-site near the corner of Borie Street and Enterprise Avenue.

- An 8-inch sanitary sewer line enters Building 1346 on the southwest side and extends southwesterly toward Enterprise Avenue. A sanitary sewer manhole is located approximately 30 feet south of the building. Four sanitary sewer manholes are located on Enterprise Avenue to the southwest.
- Three storm drainage catch basins are located on the north side of Building 1346. The storm drainage line originates near the canopy and extends northward toward a storm drain manhole located approximately 225 feet to the north at the corner of 9th Street and South Avenue B. Another storm drain manhole is located approximately 20 feet from the northwest corner of the canopy. A second storm utility line originates at a storm catch basin and storm manhole located approximately 20 feet from the south side of Building 1346 traversing the site northwesterly toward a storm manhole and catch basin along 9th Street.

Utilities on-site, and adjacent to the site within a 250-foot radius, that could serve as exposure points or as preferential pathways are shown in the following summary table.

Utility	On-site or Distance/Direction from site	Depth to Utility
Water Supply	On-site; ~20 feet	2 to 6 feet bls
Sanitary Sewer	On-site; ~100 feet west	2 to 6 feet bls
Storm Drainage	On-site; ~150 feet north	2 to 6 feet bls
Natural Gas	~300 feet to the northwest	2 to 6 feet bls

Potential receptors and preferential pathways within a 1000-foot radius of the site are summarized in the following table.

Description of Potential Receptor	Distance/Direction from Site
Construction workers in water supply utility trench.	~20 feet northwest of MW-05 and MW-06.
Commercial workers.	On-site. No complete pathways.
Trespassers.	Not applicable. Area is fenced.
Recreational visitors and/or residents.	Not applicable. Current and future site use is commercial.
Students/teachers/visitors at active school (located at Ave. D South & Borie St.).	~225 feet south/southwest of MW-06 (downgradient). No complete pathways.
Recreational visitors to football and baseball fields (east of Borie St. and north of South Ave. B).	~75 to 250 feet northeast, east, southeast, and south (upgradient, crossgradient, and downgradient). No complete pathways.

Description of Potential Receptor	Distance/Direction from Site
Students/teachers/visitors at active school (Building 199).	~600 feet northeast of Bldg. 1346 (upgradient). No complete pathways.
Groundwater at inactive industrial cooling water well (pump house Building 716).	~750 feet to the east of UST area (upgradient). No complete pathways.

A survey of groundwater users within a 7-mile radius of CNC was performed for the *Final RCRA Facility Investigation Report for Zone F* (E/A&H, 1996). According to this report, a survey of groundwater users within a 7-mile radius of CNC was conducted by the South Carolina Water Resources Commission to ascertain the extent of any shallow groundwater usage. Results of the water use investigation revealed that no drinking water wells, which utilize the shallow aquifer, are located within a 4-mile radius of CNC.

An industrial well, located approximately 750 feet east of the site and upgradient, supplied water to a compressor house for cooling tower operations. A recent visit to the site by TtNUS (October 1999) revealed an abandoned pump house for the well (Building 716). The industrial well is therefore believed to be inactive. Irrigation wells were not identified within 1,000 feet of the site. Numerous monitoring wells are located within 1,000 feet of the site. The nearest surface water body to Building 1346 is the Cooper River, located approximately 1,700 feet to the northeast.

There are no city, county, or state zoning ordinances as the property (CNC) is currently owned by the federal government. Information concerning zoning ordinances was obtained from the SOUTHDIV Remedial Project Manager located at 2155 Eagle Drive, North Charleston, South Carolina 29406 (telephone number 843-820-7307).

1.4 REGIONAL GEOLOGY AND HYDROGEOLOGY

CNC is located in Charleston County, South Carolina, in the Lower South Carolina Coastal Plain Physiographic Province on the Cooper River side of the Charleston Peninsula. The peninsula is formed by the confluence of the Cooper and Ashley Rivers. Topography in the area is typical of the South Carolina lower coastal plain and is characterized by having low-relief plains broken by the meandering streams and rivers, flowing toward the coast past occasional marine terrace escarpments (E/A&H, 1996).

The geology of the Charleston area is typical of the southern Atlantic Coastal Plain. Cretaceous-age and younger sediments thicken seaward and are underlain by older igneous and metamorphic basement rock. Surface exposures consist of Recent or Pleistocene sands, silts, and clays of high organic content referred to as the Wando Formation (E/A&H, 1996). Underlying the Wando Formation, increasing with age, are the Oligocene-age Cooper Group and the Eocene-age Santee Limestone. The Cooper Group is comprised of the Parkers Ferry, Ashley, and Harleyville Formations. The formation of particular importance in the Cooper Group is the Ashley Formation, which was formerly referred to as the Cooper Marl in most regional geologic literature. In more recent geologic nomenclature, the name "Cooper" has been given to a group of formations which includes the Ashley Formation, a pale green to olive-brown, sandy phosphoric limestone or marl, which is locally muddy and/or sandy. The Ashley Formation in the vicinity of Charleston is encountered at a depth of approximately 30 to 70 feet bls. The top of the Ashley Formation has been reported to be associated with an erosional basin and the entire Cooper Unit, including the Ashley Formation, is indicated to be approximately 300 feet thick (E/A&H, 1996).

Groundwater occurs under water table or poorly confined conditions within the Recent or Pleistocene deposits overlying the Ashley Formation of the Cooper Group. Transmissivity in the Pleistocene aquifer is generally less than 1,000 feet per day and well yields are variable, ranging from 0 to 200 gallons per minute (gpm). This groundwater contains high concentrations of iron and is commonly acidic at shallow depths (E/A&H, 1996).

The Cooper Group is hydrogeologically significant mainly because of its low permeability. In most locales, its sandy, finely granular limestone produces little or no water, but instead acts as confining material causing artesian conditions in the underlying Santee Limestone. Yields from wells in the Santee are usually less than 300 gpm (E/A&H, 1996).

1.5 SITE GEOLOGY AND HYDROGEOLOGY

The Hydrogeologic Assessment prepared by S&ME, Inc., of Mount Pleasant, South Carolina, February 1993, stated that lagoonal sediments, which include surficial fill material of black to gray-green silty clays characteristic of back barrier island sequences, are present at the site. Soft gray-green clays are generally encountered down to the Cooper Formation. The Cooper Marl was encountered at the site at a depth of 29 feet bls.

Traversing east to west across the site, the surficial soils (upper 8 feet) graded to dense red clays with a slight increase in silt content (when compared to the eastern end of the site). Below 8 feet the dense gray-green clays were again encountered. Groundwater was generally encountered at depths of 4 to 6 feet bls. The groundwater flow direction was determined to be from the east to the west across the site.

The *RCRA Facility Investigation Report* (E/A&H, 1996) described the Zone F geologic unit immediately beneath the surficial lagoonal sediments and artificial fill as the Quaternary sand (Qs) unit. It is typically a very fine to medium-grained silty sand, well to moderately well sorted, with little clay. Coloration varies between gray, orange, and brown. Occasional laminae of brown to black silt, as well as small shell fragments, are often present. Qs deposits exhibit an average distribution of 73 percent sand, 5 percent silt, and 21 percent clay with an average porosity of 38 percent. The Qs sedimentary deposits range from depths of 5 feet to 35 feet in Zone F (E/A&H, 1996).

2.0 ASSESSMENT INFORMATION

2.1 SITE-SPECIFIC GEOLOGY AND HYDROGEOLOGY

2.1.1 Site Geology

Twenty-eight soil borings were advanced at Site 25 under the supervision of a TtNUS geologist between June 5 and August 3, 1999 (Figure 3). Each of the borings was completed using direct push technology (DPT). Each DPT boring was advanced to a depth ranging from 4 to 12 feet bls providing soil samples to characterize the subsurface lithology. The majority of the soil borings terminated at a depth of 8 feet below land surface. In addition, five shallow piezometers were installed between July 27, 1999, and August 2, 1999, to depths of 12 feet below land surface to confirm the site's groundwater flow direction.

Based on lithologic descriptions from the soil borings and monitoring wells, the subsurface soil generally consist of interlayers of orange to red, tan, and gray to olive-green-gray, sandy clay, silty clay and sand near the surface to the borings' terminal depth. Generally, sandy clay was encountered in the soil samples submitted for field screening. These samples were collected from 2 to 7 feet below land surface with the majority of the field screening sample collection being performed at the 3- to 5-foot interval. Boring logs are presented in Appendix A.

2.1.2 Site Hydrogeology

Five temporary, small diameter, polyvinyl chloride (PVC) piezometers, P01, P02, P03, P04, and P05 were installed on the south side of Building 1346. The piezometers were constructed of 1-1/4-inch-diameter Schedule 80 PVC casing and well screen 10 to 15 feet in length. The screen section of the piezometer was installed to bracket the water table. The piezometers were used to confirm the groundwater depth and flow direction at the site.

Six existing permanent monitoring wells installed by S&ME, and two recently installed permanent monitoring wells installed by EnSafe were used to collect groundwater samples (and to re-confirm groundwater flow direction and gradient). The recorded water-level data collected from these wells during the investigation are presented in Table 1. Groundwater elevation measurements were recorded from the site monitoring wells on September 11, 1999. The potentiometric surface map depicts a distinct southwesterly groundwater flow direction away from the Cooper River.

As part of the *Final RCRA Facility Investigation Report for Zone F* (E/A&H, 1996), a tidal survey was conducted in selected shallow wells at low and high tide, respectively. Groundwater flow patterns occur between low and high tide events with little change. Surficial aquifer groundwater flow is highly variable in gradient and direction. A narrow groundwater divide trends east to northeast from the tank farm area in nearby Zone G. Groundwater flow south of this divide is generally in an easterly direction toward the Cooper River. A groundwater depression north of this divide is associated with well SME005. Groundwater movement north of Ninth Street is from the south and west toward the north across Hobson Avenue.

2.2 ASSESSMENT RESULTS

Twenty-eight soil borings were completed as part of the screening portion of the soil investigation at Site 25 between June 5 and August 3, 1999. The borings were completed using DPT, and samples were collected for screening. Screening samples were collected to evaluate subsurface soil and groundwater contaminant concentrations via an onsite mobile laboratory. The soil samples were collected from depths ranging from 2 to 7 feet bls. The soil and groundwater samples collected for mobile laboratory screening were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX) and naphthalene and diesel range organics (DRO).

Eight soil borings (SB-09 to SB-17) were completed, and samples were collected for analysis at a fixed-base laboratory to confirm the results of the onsite mobile screening laboratory. The confirmation soil samples were collected at depths ranging from 1 to 4 feet bls on July 7, 1999. The chemicals of concern (CoCs) evaluated and analyzed were BTEX, methyl tert-butyl ether (MTBE), and naphthalene using U.S. Environmental Protection Agency (USEPA) Method 8260; polynuclear aromatic hydrocarbons (PAHs) using USEPA Method 8270; and lead using USEPA Method 3030. Two samples from one soil boring (SB-12 at depths of 2-3 feet and 7-8 feet bls) were collected for grain-size analysis using sieve and hydrometer analysis. A soil sample collected from SB-15 at a depth of 3 to 4 feet bls was analyzed for total organic carbon (TOC) analysis using USEPA Method 415.1 and total recoverable petroleum hydrocarbons (TRPH) using USEPA Method 9071. All sample collection was conducted in accordance with the SCDHEC *South Carolina Risk-Based Corrective Action for Petroleum Releases* dated January 5, 1998. Lithologic logs for each soil boring are presented in Appendix A. The soil boring locations are shown on Figure 3.

Groundwater monitoring well purging and sampling were conducted on September 12, 13, and 21, 1999. Groundwater sampling was conducted using a peristaltic pump and low flow, quiescent techniques. The monitoring wells were sampled in accordance with SCDHEC *South Carolina Risk-Based Corrective*

Action for Petroleum Releases dated January 5, 1998. Each well was purged of three well casing volumes until water quality parameters of pH, temperature, and conductivity stabilized. The field data sheets are included in Appendix A. A summary of the field parameter measurements is presented in Table 2. Groundwater samples were analyzed for BTEX, MTBE, ethylene dibromide (EDB), and naphthalene using USEPA Method 8260 and PAHs using USEPA Method 8270. Three of the groundwater samples were also analyzed for the following natural attenuation parameters: dissolved oxygen, alkalinity, carbon dioxide, sulfide, ferrous iron, nitrite, manganese, nitrogen/nitrate, sulfate and methane. Groundwater natural attenuation data are summarized in Table 3.

2.3 FIELD SCREENING ASSESSMENT

2.3.1 Soil Vapor Assessment

Twenty-eight soil borings were completed to evaluate for soil vapors as part of the soil screening assessment at Site 25. Organic vapor analyzer (OVA) headspace measurements were recorded at 1-foot intervals from ground surface to the top of the water table. Table 4 summarizes all soil borings installed and provides the maximum soil vapor screening results. Figure 3 presents the soil boring locations.

Soil vapor concentrations ranged from non-detectable to 4,900 parts per million (ppm). Vapor concentrations exceeding 1,000 ppm were detected from eight soil boring locations. The highest soil vapor concentration of 4,900 ppm occurred from CNC25-B17 at a sample depth of 3 to 4 feet bls. Most soil vapor detection occurred from soil depths of 2 to 5 feet bls.

The soil vapor assessment was used as a screening method to assist in identifying locations for collection of confirmation soil samples analyzed at a fixed-base laboratory. Soil sample locations were determined, in part, based on these data.

2.3.2 Soil Mobile Laboratory Results

One soil sample collected from each soil boring was analyzed in a mobile laboratory for BTEX and diesel range organics using USEPA Method 8260. The soil samples were selected based upon the soil vapor screening results with the additional criterion that the samples originate in the vadose zone above the water table. Table 5 presents a summary of the analytical soil data from the mobile laboratory.

As indicated in Table 5, BTEX constituents were detected in the mobile laboratory soil screening for borings CNC25-SB-01, -05, -07, -19, -20, -21, and -25. Diesel range organics were detected in two borings, SB-01 and SB-20.

The mobile laboratory soil analysis was used as a screening method to assist in identifying locations for collection of soil samples for fixed-base laboratory analyses and to aid in delineating the extent of contamination in soil. Confirmation soil sample locations were determined, in part, based on these data.

2.3.3 Groundwater Mobile Laboratory Results

A groundwater sample was collected from soil boring locations near the former UST systems around Building 1346. Each groundwater sample was analyzed by a mobile laboratory for BTEX and diesel range organics using USEPA Method 8260. Table 6 presents a summary of the analytical groundwater data from the mobile laboratory.

BTEX constituents were reported in groundwater samples from CNC25-SB-01, -05, -07, -19, -20, -21, -22 and -27. Diesel range organics were detected above the laboratory reporting limits in SB-05, -07, -19, -20, and -21.

The mobile laboratory groundwater analysis was used as a screening method to assist in delineating the extent of groundwater contamination.

2.4 CHEMICALS OF CONCERN IN SOIL AND GROUNDWATER

2.4.1 Chemicals of Concern in Soil

Nine subsurface soil samples were collected from the Site 25 area for determination of CoCs. The soil boring locations are shown on Figure 3. Table 7 summarizes the CoCs detected in the soil samples. BTEX concentrations exceeded the risk-based screening level (RBSL) for sandy soils where groundwater is less than 5 feet bls, in all but one soil sample collected at the site (CNC25-B15). Benzene concentrations ranged from an estimated 6 parts per billion (ppb) to 120,000 ppb.

Total naphthalene concentrations (naphthalene and 2-methylnaphthalene combined) were detected above RBSL in four boring locations. Concentrations ranged from 18,000 ppb to 217,900 ppb in CNC25-B10, -12, -13, and -17. The RBSL for naphthalenes in sandy soils where depth to groundwater is less than 5 feet bls is 210 μg/kg. The RBSL for soil was selected based upon a grain-size analysis completed on sample CNC25-B12 at depths of 2 to 3 feet and 7 to 8 feet bls. Both samples confirmed the presence of a sandy soil matrix at the site. Soil analytical data sheets and grain size analysis reports are provided in Appendix B.

2.4.2 Chemicals of Concern in Groundwater

The analytical results for CoCs detected in groundwater samples are presented in Table 8. BTEX, naphthalene, and MTBE constituents were detected above RBSL at CNC25-M05 and in the duplicate sample. MTBE concentrations exceeded the RBSL at CNC25-M05, -M06, and 609004.

2.5 ANALYTICAL DATA

Soil analytical data generated during this RA are summarized and compared to the RBSLs in Table 7. Groundwater analytical data generated during this RA are summarized and compared to the RBSLs in Table 8. The soil and groundwater laboratory analytical data for this RA are included in Appendix B.

2.6 AQUIFER CHARACTERISTICS AND EVALUATION

Groundwater levels were measured from the site monitoring wells on September 11, 1999. The groundwater flow direction across the site was determined to be southwesterly toward Enterprise Avenue as illustrated on Figure 6.

As part of the *Final RCRA Facility Investigation Report for Zone F*, rising and falling head slug tests were conducted on several shallow monitoring wells located throughout the Zone F Quaternary sand unit to determine the hydraulic conductivity of the surficial aquifer (E/A&H, 1996). Slug tests were conducted by instantaneously adding (falling head) or removing (rising head) a volume (slug) of water from the well and measuring the recovering water level with a data logger. A hydraulic conductivity value was then calculated for the rising head test and for the falling head test. The average hydraulic conductivity for each well was determined by calculating the geometric mean of the rising and falling head values. Because hydraulic conductivity data are lognormally distributed, the geometric mean was determined to be the most representative measure of central tendency.

The well construction details and boring logs for each well tested during the RCRA investigation were reviewed to determine which wells were most representative of the conditions present at Site 25. To make this determination, the screened interval and proximity to the site were evaluated. Based on this evaluation, monitoring wells 613004, 620002, 607001, and 613001 were selected as the most representative wells (see Appendix C for slug test data).

Potential movement of groundwater at the site may be described in terms of transportation by natural flow system in the saturated zone, assuming groundwater flow follows Darcy's Law. Using Darcy's Law the average linear groundwater velocity may be expressed as:

$$V = \left(\frac{K}{n}\right) x\, i$$

where:

V = average velocity
K = hydraulic conductivity = 0.7 ft/day
n = volumetric porosity = 0.36
(based on analyses of Qs samples in the *Zone F RFI Report*)
i = most recent hydraulic gradient measurement = 0.0096 ft/ft

therefore:

$$V = \left(\frac{0.7\ \text{ft/day}}{0.36}\right) x\ 0.0096\ \text{ft/ft}$$

$$V = 0.0187\ \text{ft/day} \ \text{ or } 6.8\ \text{ft/year}$$

In summary, the seepage velocity of the surficial aquifer was calculated to be approximately 6.8 feet per year based on a hydraulic conductivity of 0.7 feet per day, a hydraulic gradient of 0.0096 feet per foot, and a porosity of 36 percent for sandy soil.

2.7 FATE AND TRANSPORT MODELING

Soil and groundwater concentrations exceed the RBSL; therefore, evaluation of Site 25 will continue beyond Tier I. Fate and transport modeling is not required because both the source of contamination and the potential receptor are located onsite, however modeling was performed because of the high concentrations onsite.

The Domenico model was the fate and transport model used to determine groundwater site-specific target levels (SSTLs) in the risk analysis. The Domenico dilution/attenuation model is presented in the SCDHEC guidance document, *South Carolina Risk-Based Corrective Action for Petroleum Releases* (SCDHEC 1998). This model is very conservative in that it assumes an infinite mass, areal source condition through which groundwater flows. The model incorporates biological decay effects through a first-order decay process; however, this mechanism was ignored because SCDHEC guidance specifies that the decay rate must be assumed to be zero if site-specific decay rates have not been determined.

The impacted groundwater source area was modeled as 50 feet (15.00 meters) wide and 6.56 feet (2.0 meters) deep; these values are conservative defaults suggested by the American Society for Testing Materials (ASTM) *Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites* (ASTM, 1997). The maximum source concentrations are assumed to exist throughout the source area, further compounding the conservatism of the estimate.

Site-specific data were used for saturated hydraulic conductivity, hydraulic gradient, porosity, and fraction of organic carbon in soil (2.47E-06 m/sec, 0.0096 ft/ft, 0.36 cm^3/cm^3, and 6.16E-4 g-C/g-soil, respectively). The soil bulk density (1.73 g/cm^3) was determined using a porosity of 0.36 and assuming that the specific gravity of the soil particles is 2.7.

However, because free product was previously detected in monitoring well MW05, the theoretical groundwater concentration in equilibrium with unleaded gasoline based on Raoult's Law (see Appendix D) was calculated for each of the potential CoCs. These calculated values were used for the source concentration in predicting the 10- and 20-year plume migration. This analysis showed that the theoretical concentrations of benzene (59.8 mg/L), toluene (96.8 mg/L), ethylbenzene (3.2 mg/L), xylene (24.9 mg/L), MTBE (5289 mg/L), and naphthalene (0.22 mg/L) each exceed the groundwater RBSLs; therefore, these CoCs were modeled. The concentration of naphthalene (i.e., 0.848 mg/L) detected in well MW05 exceeds the theoretical calculated concentration for gasoline (0.22 mg/L) indicating that free product may have contaminated the well at the time it was sampled and that a different petroleum product (e.g., diesel fuel) may have been released during the site's history.

The following estimates of dispersivity were used in the Domenico model as given in SCDHEC (1998):

Parameter	Estimate
Longitudinal Dispersivity, α_x	x/10, where x= distance between the point of exposure and the source or compliance point
Transverse Dispersivity, α_y	$\alpha_x/3$
Vertical Dispersivity, α_z	$\alpha_x/20$

2.8 PREDICTED MIGRATION AND ATTENUATION OF CHEMICALS OF CONCERN

The Domenico model was used to predict the distance at which the leading edge of the plume is attenuated to SCDHEC RBSLs in 10 and 20 years without using degradation due to biological decay. This was done by adjusting the time to 10 years (3.15×10^8 sec) and 20 years (6.31×10^8 sec) and solving for distance (x) by trial and error. The source was assumed to be the impacted area onsite. The distance was changed until the required distance that is necessary for the concentration to attenuate to the RBSLs was determined. Model estimates for 10 and 20 years are provided in the following table:

Domenico Model Time Period	Chemical of Concern	Estimated Distance Traveled (feet)
10 year	Benzene	202
	Toluene	108
	Ethylbenzene	56
	Xylenes	26
	MTBE	287
	Naphthalene	25.5
20 year	Benzene	355
	Toluene	159
	Ethylbenzene	77
	Xylenes	36.5
	MTBE	507
	Naphthalene	34

The Domenico 10-year and 20-year simulation spreadsheets are presented in Appendix D.

3.0 RISK EVALUATION

3.1 TIER 1 EVALUATION

Performance of a Site Conceptual Model is required because the RBSLs for soil and groundwater were exceeded. Maximum concentrations of benzene, toluene, ethylbenzene, xylene, and naphthalene exceeded the RBSLs for sandy soil where depths to groundwater are 5 feet bls or less (table 7). Maximum concentrations of benzene, ethylbenzene, toluene, xylene, naphthalene, and MTBE exceeded the RBSLs for groundwater (Table 8). Exceeding the soil RBSL requires identification of current and future potential receptors and human exposure pathways.

3.1.1 Exposure Pathway Analysis

This section presents the receptor characterizations of the potentially exposed populations in the vicinity of the site and identifies the potentially complete exposure pathways for those receptors. SCDHEC requires that only those exposure pathways with CoC concentrations exceeding Tier 1 RBSL concentrations are examined in a Tier 2 risk-based corrective action report. Tables 9 and 10 present the exposure pathway assessments for current and future use scenarios.

3.1.2 On-Site Commercial/ Industrial Worker

An on-site commercial or industrial worker is defined as a business employee who works in a commercial/ industrial capacity at the site. The future use of the property is expected to be industrial or commercial for the foreseeable future; therefore, an on-site worker was considered as a potential receptor. Incidental ingestion and dermal contact with impacted soil are expected to be negligible for commercial/industrial workers because they are located inside a building. Drinking water at this site is provided by the city; therefore, ingestion of groundwater is not a complete exposure pathway. Building foundations are assumed sufficient to prevent volatilization from both soil and groundwater into a commercial building, and there is no history of vapors in the commercial building. It is unlikely that any additional exposure pathways will exist for future on-site workers; therefore, no complete pathways exist for either current or future commercial/ industrial workers.

3.1.3 On-Site Visitor

An on-site visitor is defined as any person other than a worker who might come on site. On-site visitors would have the same exposure pathways as commercial workers, but their exposure duration would be much shorter. This receptor does not have to be quantified because a potential on-site visitor's chemical intake would not determine risk or cleanup levels at the site.

3.1.4 On-Site Construction Worker

An on-site construction worker is defined as a laborer who would be involved in intrusive activities on or around the site, particularly in the area of subsurface utilities. On-site construction workers could be exposed to constituents in soil by the following pathways: inhalation of volatiles from soil, dermal contact with soil, and incidental ingestion of soil. On-site construction workers could be exposed to constituents in groundwater by the following pathways: inhalation of volatiles from groundwater, dermal contact with groundwater, and incidental ingestion of groundwater. A fresh water distribution line runs through the site; therefore, the point of exposure location for the on-site construction worker was considered to be at the source.

3.1.5 On-Site Resident

An on-site resident is defined as any person making his or her home at the site. This site is expected to remain a commercial/industrial facility; therefore, the on-site resident receptor was not considered further.

3.1.6 Off-Site Resident

An off-site resident is defined as any person making his or her home near the site. This receptor's location is either an actual current residence near the site or is a vacant lot or property on which a residence could be built. The site is located in an area that will likely remain commercial/industrial. Therefore, this potential receptor was not considered further.

3.1.7 Surface Water

The Cooper River is located approximately 1,700 feet upgradient and to the northeast of the site. Because of the distance to the river, this exposure pathway was not considered for ingestion of surface water.

3.2 TIER 2 EVALUATION

The Tier 1 Site Conceptual Model identified one possible receptor with six pathways:

1. A construction worker in a utility trench who might ingest subsurface soil, have dermal contact with impacted subsurface soil, or inhale volatilized vapors from affected soil.

2. A construction worker in a utility trench who might ingest contaminated groundwater, have dermal contact with contaminated groundwater, or inhale vapors from contaminated groundwater.

Based on the site conceptual model, a Tier 2 evaluation was performed.

3.2.1 Ingestion and Dermal Contact with Soil for a Construction Worker in a Utility Trench

The Site Conceptual Model identified the only potential receptor as a construction worker ingesting or having dermal contact with soil while working in a utility trench. For ingestion and dermal contact with soil while working in a utility trench, subsurface soil exposure to a construction worker is similar to surface soil exposure. The RBSLs given by SCDHEC for ingestion and dermal contact with surficial soils by a commercial worker are compared to the site soil concentrations in the table below. (RBSLs for commercial workers are conservative for construction workers. See footnote (1) below.)

CoC	RBSL*	SB-09	SB-10	SB-11	SB-12	SB-13	SB-13D	SB-14	SB-15	SB-16	SB-17
Benzene	**200**	0.052	9.100	.006	120.0	5.0	10.0	.007	< 0.006	0.008	32.0
Toluene	**410,000**	0.015	< 1.60	< 0.006	360.0	8.4	18.0	0.012	< 0.006	< 0.005	240.0
Ethylbenzene	**200,000**	< 0.006	63.0	0.014	560.0	73.0	130.0	0.013	< 0.006	< 0.005	49.0
Xylenes	**1,000,000**	< 0.006	3.0	0.019	2200.0	160.0	300.0	0.012	< 0.006	< 0.005	250
Benzo(a)-anthracene	**3.9**	< 0.4	< 0.46	< 0.36	< 0.43	<0.40	0.240J	< 0.40	<0.36	< 0.4	< 0.4
Benzo(b)-fluoranthene	**3.9**	< 0.40	< 0.46	< 0.36	< 0.43	<0.40	0.40	< 0.40	<0.36	< 0.40	< 0.40
Benzo(k)-fluoranthene	**39**	< 0.4	< 0.46	< 0.36	< 0.43	<0.40	<0.40	<0.40	<0.36	< 0.40	< 0.40
Chrysene	**390**	< 0.4	< 0.46	< 0.36	< 0.43	<0.40	<0.40	<0.40	<0.36	< 0.40	< 0.40
Dibenzo(a,h)-anthracene	**0.39**	< 0.4	**< 0.46**	< 0.36	**< 0.43**	<0.40	<0.40	<0.40	<0.36	< 0.40	< 0.40
Naphthalene[2]	**41,000**	0.004J	31.6	0.066	217.90	80.0	155.0	0.60	<0.006	0.004J	18.0

Note: All concentrations in mg/kg. Concentrations which exceed RBSL are bolded.

* RBSLs for ingestion or dermal contact with surficial soil (RBCA, Table B6).

(1) A commercial worker has a typically assumed exposure duration of 25 years and an exposure frequency of 250 days/year. A construction worker would be expected to have a much lower exposure duration and exposure frequency based on the nature of utility or construction work. The exposure frequency can be assumed to be 90 days/year and the exposure duration can be assumed to be 1 year. These assumptions are based on the nature of utility work. Therefore, the RBSLs for construction workers are expected to be higher than those for commercial workers.

(2) Naphthalene (Total) combines Naphthalene (8260 value) and 2-Methylnaphthalene (8270 value).

As shown in the above table, maximum soil concentrations of constituents do not exceed the RBSLs for any CoC except dibenzo(a,h) anthracene. The concentrations for dibenzo(a,h) anthracene exceed the Commercial RBSL for ingestion or dermal contact with surficial soil. However, the RBSLs provided in the RBCA Guidance assume that a commercial worker will have an exposure duration for 25 years having an exposure frequency of 250 days per year. A construction worker would be expected to have a much lower exposure duration and exposure frequency based on the nature of utility, construction, or remediation work. The exposure frequency can be assumed to be 90 days/year or less and the exposure duration can be assumed to be 1 year or less. These assumptions are based on the nature of typical utility-type work. Furthermore, the maximum source concentrations of dibenzo(a,h)anthracene detected in soils barely exceed the above RBSLs (probably occurring because the laboratory reporting limit, or practical quantitation limit, slightly exceeds the RBSL). Therefore, dibenzo(a,h)anthracene is not considered a threat to a construction worker in a utility trench. A construction worker ingesting or contacting impacted soil is not considered at-risk and the dermal/ingestion pathway is not considered for further analysis.

3.2.2 Ingestion, Dermal Contact, or Inhalation of Vapors from Groundwater for a Construction Worker in a Utility Trench

An additional completed pathway for construction workers is BTEX, naphthalene, and MTBE in the groundwater possibly exposing the workers to CoCs while working in a utility trench. The construction worker's potential exposure to groundwater containing any of these CoCs was assumed to consist of three pathways: dermal contact, incidental ingestion, and inhalation of volatiles.

3.2.3 Calculation of Groundwater RBSLs Protective of a Construction Worker in a Utility Trench

Groundwater RBSLs provided by SCDHEC are for ingestion only; therefore, RBSLs were calculated for the additional pathways of dermal contact, incidental ingestion, and inhalation of volatiles.

Groundwater RBSLs for the construction worker were calculated for three pathways: dermal contact, incidental ingestion, and inhalation of volatiles. A target cancer risk of 1×10^{-6} and a target hazard quotient of 1 were used in the calculations. Standard defaults were used when available and applicable to a construction worker. When no standard parameters were available, conservative assumptions were used. Where possible, site-specific parameters were used for site conditions. For all pathways, the exposure frequency was assumed to be 90 days/year and the exposure duration was assumed to be 1 year. These assumptions were considered conservative based on the nature of utility work.

The dermal contact RBSLs were calculated using procedures in *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual, Supplemental Guidance, Dermal Risk Assessment, Interim Guidance* (USEPA Peer Consultation Workshop Draft, 1998). Based on expected limited contact with groundwater, the event frequency was assumed to be one event/day and the event duration was assumed to be 1 hour/event. The skin surface area available for contact was 4500 cm^2, based on one-fourth the skin surface area given in the risk assessment guidance document for a swimming adult.

The incidental ingestion RBSLs were calculated using the equation given in *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Interim Final)*, EPA/540/1-89/002 (EPA 1989). An incidental ingestion rate of 0.01 L/day was assumed based on a fraction (12.5 percent) of the incidental ingestion rate for a wading adult (0.01 L/hr), considered for an 8-hour work day. The incidental ingestion rate for wading adults is given in *Supplemental Guidance to RAGS: Region 4 Bulletins, Human Health Risk Assessment* (USEPA Region 4, 1995).

The inhalation RBSLs were calculated using equations given in the ASTM *Standard Guide for Risk-Based Corrective Action Applied to Petroleum Release Sites, Designation E 1739-95e1* (1997).

The following table summarizes the calculated RBSLs for the analyzed pathways and shows the minimum RBSL, regardless of the pathway (see calculations in Appendix D).

	Dermal RBSL (mg/L)	**Incidental Ingestion RBSL (mg/L)**	**Inhalation RBSL (mg/L)**	**Selected Minimum Ground-water RBSL (mg/L)**	**Maximum Onsite Groundwater Conc. (mg/L)**	**Greater than the RBSL?**
Benzene	0.85	68.52	0.15	0.15	**26**	Yes
Toluene	23.98	5677.78	5.38	5.38	**38**	Yes
Ethylbenzene	6.05	2838.89	14.50	6.05	3.2	No
Xylenes	102.33	56777.78	NA*	102.33	13	No
Naphthalenes	1.63	1135.56	2.63	1.63	0.848	No
MTBE	25.92	141.94	293.44	25.92	**33**	Yes

Note:* No inhalation reference dose is available for xylenes; therefore, no inhalation RBSL can be calculated.

Based on the above table of calculated RBSLs, benzene, toluene, and MTBE in the groundwater pose a risk to a construction worker exposed to groundwater. Ethylbenzene, xylene, and naphthalene concentrations in groundwater do not pose a threat to the construction worker.

3.2.4 Risk From Soil Leaching to Groundwater for a Construction Worker in a Utility Trench

The Soil Leachability Model was used to calculate SSTLs for the establishment of soil cleanup criteria for benzene, toluene, ethylbenzene, xylenes, and naphthalene in soil. Site-specific parameters were used when available; otherwise, values were estimated from the charts on pages C2 through C5 of the SCDHEC guidance document, *Risk-Based Corrective Action for Petroleum Releases*, January 5, 1998. Grain size analysis of a representative vadose soil sample (SB-12 from 2 to 3 feet bls), showed that the soil contained 88 percent sand and 7 percent clay. The calculated RBSLs for a construction worker possibly ingesting, coming in contact with, or inhaling volatiles from the groundwater were used for calculating the SSTLs shown below. Appendix D presents the calculations for the model.

Chemical of Concern	Soil Leaching SSTL (mg/kg)	Maximum Onsite Soil Concentration (mg/kg)	Greater than the SSTL
Benzene	**0.2**	**120**	Yes
Ethylbenzene	**14.5**	**560**	Yes
Toluene	**11**	**360**	Yes
Xylenes	**686**	**2200**	Yes
Naphthalenes	**24**	**217**	Yes

Because the maximum soil concentration of benzene, ethylbenzene, toluene, xylene, and naphthalene found during the site assessment exceeds the calculated SSTLs for these CoCs, the construction worker is considered at-risk if exposed to groundwater leached through the impacted soil.

3.2.5 Inhalation of Volatiles from Soil for a Construction Worker in a Utility Trench

RBSLs for a construction worker in a trench inhaling volatile vapors from soil were calculated. The calculations are provided in Appendix D. The inhalation RBSLs were calculated using equations given in the ASTM *Standard Guide for Risk-Based Corrective Action Applied to Petroleum Release Sites, Designation E 1739-95E1* (1997).

The following table summarizes the calculated RBSLs for the analyzed pathway:

Chemical of Concern	Inhalation SSTL (mg/kg)	Maximum Onsite Soil Concentration (mg/kg)	Greater than the SSTL
Benzene	**7,853**	120	No
Ethylbenzene	**226,430**	360	No
Toluene	**85,887**	560	No
Xylenes*	**NA**	2200	NA
Naphthalenes	**3,123**	218	No

Note: * No inhalation reference dose is available for xylenes; therefore, no inhalation RBSL can be calculated.

Based on the above table, the construction worker exposed to subsurface soil is not at risk if inhaling benzene, toluene, ethylbenzene, xylenes, or naphthalenes volatilizing from the soil.

3.3 SUMMARY AND COMPARISON OF THE SELECTED SSTLs

The following table summarizes the calculated SSTLs according to media (for exposure) and exposure pathway for the CoCs that may be a threat to the identified receptor construction worker in an onsite utility trench.

Media (for exposure)	Exposure Pathway	CoC	Unit	SSTL	Maximum Onsite Concentration	Greater than SSTL?
Groundwater	Dermal contact, inhalation, or ingestion	Benzene	mg/L	**0.15**	26	Yes
		Ethylbenzene	mg/L	**5.38**	38	Yes
		MTBE	mg/L	**25.92**	33	Yes
Soil (leaching from groundwater)	Dermal or incidental ingestion	Benzene	mg/kg	**0.2**	120	Yes
		Ethylbenzene	mg/kg	**14.5**	560	Yes
		Toluene	mg/kg	**11**	360	Yes
		Xylenes	mg/kg	**686**	2200	Yes
		Naphthalenes	mg/kg	**24**	218	Yes
Soil (leaching from groundwater)	Volatilization or inhalation	Benzene	mg/kg	**0.2**	120	No
		Ethylbenzene	mg/kg	**14.5**	560	No
		Toluene	mg/kg	**11**	360	No
		Xylenes	mg/kg	**686**	2200	No
		Naphthalenes	mg/kg	**24**	218	No

The above SSTLs should be used for establishing cleanup levels at the site.

3.4 RECOMMENDATIONS FOR FURTHER ACTION

Corrective action is required at Site 25. The benzene, ethylbenzene, and MTBE in groundwater are above the selected minimum SSTLs calculated for a construction worker. In addition, the SSTLs for soil leaching to groundwater are exceeded for benzene, toluene, ethylbenzene, xylenes, and naphthalenes; therefore, corrective action is necessary. The goal of corrective action is to prevent an impact to the identified potential receptor (the construction worker in an onsite utility trench).

4.0 REFERENCES

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TABLES

TABLE 1

WATER LEVEL AND SURVEY DATA
SITE 25, BUILDING 1346
ZONE F, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Monitoring Well	Northing	Easting	TOCeL (feet)	Well Total Depth (feet)	Well Sceen Depth (feet)	Water Level BTOC (feet)	Groundwater Elevation (feet)
609002	373661.0421	2318340.847	7.83	12.0	1-11	5.49	2.34
609004	373737.5122	2318446.267	7.54	13.0	2-12	3.42	4.12
CNC25-MW01	373880.8929	2318417.096	7.90	12.0	1-11	3.58	4.32
CNC25-MW03	373506.6288	2318190.059	7.40	13.0	2-12	5.87	1.53
CNC24-MW04*	373760.4013	2318182.343	8.00	13.0	2-12	n/m	n/m
CNC25-MW05	373687.9653	2318295.297	8.02	13.0	2-12	5.46	2.56
CNC25-MW06	373677.0889	2318284.952	7.92	27.0	16-26	5.98	1.94
CNC25-MW07	373696.3178	2318103.999	7.41	13.0	2-12	6.44	0.97
CNC25-MW08	373978.0111	2318287.141	7.60	13.0	2-12	3.85	3.75

Notes:

Water level measurements were taken on September 11, 1999, and are tide-synchronous (MW06 is a deep well).

CNC25-MW02 not sampled (full of sediment)

TOCeL -- top of casing elevation

BTOC -- below top of casing

* Site 24

n/m-- not measured

TABLE 2

GROUNDWATER FIELD MEASUREMENTS
SITE 25, BUILDING 1346
ZONE F, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Well I.D.	Date Sampled	Purge method	Volume (gallons)	Temp. (° C)	pH	Conductivity (umhos/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)
CNC25-M01	09/21/99	PP	4.5	25.9	6.50	1.04	*	0.21
CNC25-M03	09/12/99	PP	4.0	29.9	5.08	1.23	25	1.43
CNC25-M04	09/13/99	PP	3.5	28.6	6.00	2.03	< 1	1.22
CNC25-M05	09/21/99	PP	6.0	29.7	5.33	0.269	< 1	5.45
CNC25-M06	09/12/99	PP	10.0	25.7	6.47	5.72	27	1.67
CNC25-M07	09/21/99	PP	4.0	29.2	5.33	0.686	< 1	5.88
CNC25-M08	09/12/99	PP	4.0	28.7	5.36	2.40	35	1.53
609002	09/21/99	PP	4.0	26.0	6.70	4.09	3	0.11
609004	09/21/99	PP	5.0	26.6	6.45	0.98	75	1.77

Notes:

PP - Peristaltic pump, low flow technique

umhos/cm - micro mhos per centimeter

NTU - Nephelometric turbidity units

mg/L - milligrams per liter

* -- instrument malfunction; water visually clear

TABLE 3

GROUNDWATER NATURAL ATTENUATION FIELD MEASUREMENTS
SITE 25, BUILDING 1346
ZONE F, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Well I.D.	Date Sampled	Dissolved Oxygen (mg/L)	Alkalinity (mg/L)	Carbon Dioxide (mg/L)	Sulfide (mg/L)	Ferrous Iron (mg/L)	Nitrite (mg/L)	Manganese (mg/L)	Nitrogen/ Nitrate (mg/L)*	Sulfate (mg/L)*	Methane (ug/L)*
CNC25-MW01	09/21/99	0.30	552	300	0.00	3.30	0.126	0.0	0.29	160	4400 6000 (D)
CNC25-MW05	09/21/99	0.60	136	388	0.11	3.30	0.000	0.4	<0.050	40	3500 4400 (D)
CNC25-MW07	09/21/99	0.30	63	204	0.00	0.17	0.047	0.1	0.16	160	6.5

Notes:

mg/L - milligrams per liter
ug/L - micrograms per liter
* fixed-base laboratory analysis
D - laboratory duplicate

TABLE 4

SUMMARY OF SOIL BORINGS AND SOIL VAPOR SCREENING
SITE 25, BUILDING 1346
ZONE F, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Soil Boring Location	Sample Identification	Sample Lithology	Soil Sample Condition	Soil Sample Depth (feet)	Total Boring Depth (feet)	Sample Interval Maximum OVA Reading (PPM)
CNC25-B01	25SFB010506	Sandy Clay	Moist	05-06	12	3,000
CNC25-B02	25SFB020203	Sandy Clay	Moist	02-03	12	5
CNC25-B03	25SFB030405	Silty Clay	Moist	04-05	11	19
CNC25-B04	25SFB040203	Sandy Clay	Moist	02-03	8	0
CNC25-B05	25SFB050405	Sandy Clay	Moist	04-05	11	80
CNC25-B06	25SFB060405	Silty Clay	Moist	04-05	12	1,120
CNC25-B07	25SFB070607	Sandy Clay	Moist	06-07	12	260
CNC25-B08	25SFB080304	Silty Clay	Moist	03-04	11	140
CNC25-B09	25SLB090304	Sandy Silty Clay	Moist	03-04	8	106
CNC25-B10	25SLB100102	Silty Clay	Moist	01-02	8	4,860
CNC25-B11	25SLB110203	Clayey Sand	Moist	02-03	8	1,610
CNC25-B12	25SLB120203	Silty Sandy Clay	Moist	02-03	8	4,790
CNC25-B13	25SLB130203	Clayey Sand	Moist	02-03	8	4,300
CNC25-B14	25SLB140304	Sand	Moist	03-04	8	820
CNC25-B15	25SLB150304	Sand	Moist	03-04	4	150
CNC25-B16	25SLB160304	Sandy Clay	Moist	03-04	4	250
CNC25-B17	25SLB170304	Sandy Clay	Moist	03-04	4	4,900
CNC25-B18	25SFB180405	Silty Clay	Moist	04-05	12	110
CNC25-B19	25SFB190304	Silty Clay	Dry	03-04	8	0

TABLE 4

SUMMARY OF SOIL BORINGS AND SOIL VAPOR SCREENING
SITE 25, BUILDING 1346
ZONE F, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA
[PAGE 2 of 2]

Soil Boring Location	Sample Identification	Sample Lithology	Soil Sample Condition	Soil Sample Depth (feet)	Total Boring Depth (feet)	Sample Interval Maximum OVA Reading (PPM)
CNC25-B20	25SFB200405	Sandy Clay	Dry to Moist	04-05	8	2,410
CNC25-B21	25SFB210506	Sandy Clay	Moist	05-06	8	60
CNC25-B22	25SFB220607	Clayey Sand	Moist	06-07	8	0
CNC25-B23	25SFB230607	Silty Clay	Moist	06-07	12	7
CNC25-B24	25SFB240607	Sandy Clay	Moist	06-07	8	0
CNC25-B25	25SFB250506	Sandy Clay	Moist	05-06	8	0
CNC25-B26	25SFB260405	Clayey Sand	Moist	04-05	8	0
CNC25-B27	25SFB270304	Sandy Clay	Moist	03-04	8	190
CNC25-B28	25SFB280304	Clayey Sand	Moist	03-04	8	0

Notes:

Soil Borings B09 – B17 were completed for fixed-base laboratory analysis.
OVA - organic vapor analyzer equipped with a flame ionization detector
PPM - parts per million

TABLE 5

SUMMARY OF MOBILE LABORATORY SCREENING RESULTS FOR SOIL
SITE 25, BUILDING 1346
ZONE F, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Sample I.D.	Benzene (ug/kg)	Toluene (ug/kg)	Ethylbenzene (ug/kg)	m&p-Xylene (ug/kg)	o-Xylene (ug/kg)	Naphthalene (ug/kg)	DRO (mg/kg)
25SFB010506	4786 E	14787 E	4368 E	15960 E	6605 E	1515 E	290
25SFB020203	ND	ND	ND	ND	ND	ND	ND
25SFB030405	ND	ND	ND	ND	ND	ND	ND
25SFB040203	ND	ND	ND	ND	ND	ND	ND
25SFB050405	80.0	ND	40.5 J	ND	ND	54.0 J	ND
25SFB060405	ND	ND	ND	ND	ND	ND	ND
25SFB070607	175	82.5	ND	ND	ND	ND	ND
25SFB080304	ND	ND	ND	ND	ND	ND	ND
25SFB180405	ND	ND	ND	ND	ND	ND	ND
25SFB190304	3025**	54000 E**	23400 E**	96800 E**	40200 E**	5620**	ND
25SFB200405	768 E	3620 E	1240 E	3950 E	1490 E	64.8	51.5
25SFB210506	234	203	156	320	99.6	29.7 J	ND
25SFB220506	ND	ND	ND	ND	ND	ND	ND
25SFB230607	ND	ND	ND	ND	ND	ND	ND
25SFB240607	ND	ND	ND	ND	ND	ND	ND
25SFB250506	ND	ND	5.03 J	20.3 J	7.72 J	ND	ND
25SFB260405	ND	ND	ND	ND	ND	ND	ND
25SFB270304	ND	ND	ND	ND	ND	ND	ND
25SFB280304	ND	ND	ND	ND	ND	ND	ND

(**10X Dilution)

TABLE 6

SUMMARY OF MOBILE LABORATORY SCREENING RESULTS FOR GROUNDWATER
SITE 25, BUILDING 1346
ZONE F, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Sample I.D.	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	m&p-Xylene (ug/L)	o-Xylene (ug/L)	Naphthalene (ug/L)	DRO (mg/L)
25GFB010912	44.7	56.8	9.63 J	29.0	15.3	ND	ND
25GFB020811	ND	ND	ND	ND	ND	ND	ND
25GFB030811	ND	ND	ND	ND	ND	ND	ND
25GFB040508	ND	ND	ND	ND	ND	ND	ND
25GFB050811	631 E	27.6	251 E	141	52.2	180	4.0*
25GFB060811	ND	ND	ND	ND	ND	ND	ND
25GFB070912	2503 E	185	523 E	ND	50.8	30.9	3.0*
25GFB080407	ND	ND	ND	ND	ND	ND	ND
25GFB180512	ND	ND	ND	ND	ND	ND	ND
25GFB190408	46500 E**	33500 E**	5620 E**	17900 E**	6770 E**	3420**	17.3 *
25GFB200508	2780 E	455 E	183	440 E	228	251	2.0*
25GFB210608	5360 E	156	1420 E	877 E	272	295	4.20
25GFB220708	11.8	ND	ND	ND	ND	ND	ND
25GFB230912	ND	ND	ND	ND	ND	ND	ND
25GFB240708	ND	ND	ND	ND	ND	ND	1.34 J
25GFB250708	ND	ND	ND	ND	ND	ND	ND
25GFB260508	ND	ND	ND	ND	ND	ND	ND
25GFB270508	6.29 J	ND	ND	ND	8.90 J	ND	ND
25GFB280508	ND	ND	ND	ND	ND	ND	ND

* Gasoline signature
** 10X dilution

TABLE 7

SUMMARY OF FIXED-BASE LABORATORY ANALYTICAL RESULTS FOR CHEMICALS OF CONCERN IN SOIL
SITE 25, BUILDING 1346
ZONE F, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Soil Boring / Sample No.	MTBE (ug/kg)	Benzene (ug/kg)	Toluene (ug/kg)	Ethyl-benzene (ug/kg)	Xylenes (total) (ug/kg)	Benzo(a) anthracene (ug/kg)	Benzo(b) fluoranthene (ug/kg)	Benzo(k) fluoranthene (ug/kg)	Chrysene (ug/kg)	Dibenzo(a,h) anthracene (ug/kg)	Naphthalene* (ug/kg)	Lead (mg/kg)
RBSL [1]	**None**	**5**	**1,622**	**1,260**	**42,471**	**73,084**	**29,097**	**2.3E+05**	**12,998**	**87,899**	**210**	**None**
CNC25-B09 / 25SLB090304	< 6	**52**	15	< 6	< 6	< 400	< 400	< 400	< 400	< 400	4 [J]	10.5
CNC25-B10 / 25SLB100102	< 800	**9,100**	< 1600	**63,000**	3,000	< 460	< 460	< 460	< 460	< 460	**31,600**	34.7
CNC25-B11 / 25SLB110203	< 6	**6 [J]**	< 6	14	19	< 360	< 360	< 360	< 360	< 360	66	125
CNC25-B12 / 25SLB120203	< 750	**120,000**	**360,000**	**560,000**	**2.2E+06**	< 430	< 430	< 430	< 430	< 430	**217,900**	26.2
CNC25-B13 / 25SLB130203	< 600	**5,000**	**8,400**	**73,000**	**160,000**	< 400	< 400	< 400	< 400	< 400	**80,000**	6.2
CNC25-B13 / 25SLB130203D	< 550	**10,000**	**18,000**	**130,000**	**300,000**	240 [J]	< 400	< 400	< 400	< 400	**155,000**	10.4
CNC25-B14 / 25SLB140304	< 5	**7**	12	13	12	< 400	< 400	< 400	< 400	< 400	60	4.9
CNC25-B15 / 25SLB150304	< 6	< 6	< 6	< 6	< 6	< 360	< 360	< 360	< 360	< 360	< 6	5.9
CNC25-B16 / 25SLB160304	< 5	**8**	< 5	< 5	< 5	< 400	< 400	< 400	< 400	< 400	4 [J]	6.5
CNC25-B17 / 25SLB170304	**4,300**	**32,000**	**240,000**	**49,000**	**250,000**	< 400	< 400	< 400	< 400	< 400	**18,000**	7.4

Notes:

Sample Collection Date: June 10, 1999.

[1] SCDHEC Risk-Based Screening Levels for sandy soil; depth to groundwater less than 5 feet.

[J] Indicates the presence of an analyte at a concentration less than the reporting limit and greater than the detection limit.

D Indicates a duplicate sample.

* Naphthalene includes Naphthalene (8260 value) and 2-Methylnaphthalene (8270 value) for values in bold.

TABLE 8

SUMMARY OF FIXED-BASE LABORATORY ANALYTICAL RESULTS FOR CHEMICALS OF CONCERN IN GROUNDWATER
SITE 25, BUILDING 1346
ZONE F, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Monitoring Well Sample No.	Date Sampled	Benzene (ug/L)	Ethyl-benzene (ug/L)	Toluene (ug/L)	Xylenes (total) (ug/L)	Naphthalene (ug/L)	Benzo(a) anthracene (ug/L)	Benzo(b) fluoranthene (ug/L)	Benzo(k) fluoranthene (ug/L)	Chrysene (ug/L)	Dibenzo(a,h) anthracene (ug/L)	MTBE (ug/L)	EDB (ug/L)	Lead (ug/L)
RBSL(1)		**5**	**700**	**1000**	**10000**	**10 (2)**	**10 (2)**	**10 (2)**	**10 (2)**	**10 (2)**	**10 (2)**	**40**	**5**	**15**
CNC25M-01 25GLM0101	09/21/99	< 5	< 5	< 5	< 5	< 5	< 10	< 10	< 10	< 10	< 10	< 5	< 5	3.9
CNC25M-03 25GLM0301	09/12/99	< 5	< 5	< 5	< 5	< 5	< 10	< 10	< 10	< 10	< 10	< 5	< 5	< 1.4
CNC25M-04 25GLM0401	09/13/99	< 5	< 5	< 5	< 5	< 5	< 10	< 10	< 10	< 10	< 10	< 5	< 5	< 1.09
CNC25M-05 25GLM0501	09/21/99	**25000**	**3000**	**35000**	**12000**	**760 (3)**	< 10	< 10	< 10	< 10	< 10	**33000**	< 250	7.3
CNC25M-05 25GLM0501D	09/21/99	**26000**	**3200**	**38000**	**13000**	**848 (3)**	< 10	< 10	< 10	< 10	< 10	**33000**	< 250	7
CNC25M-06 25GLM0601	09/12/99	< 5	< 5	< 5	< 5	< 5	< 10	< 10	< 10	< 10	< 10	**220**	< 5	< 1.09
CNC25M-07 25GLM0701	09/13/99	< 5	< 5	< 5	< 5	< 5	< 10	< 10	< 10	< 10	< 10	< 5	< 5	< 1.09
CNC25M-08 25GLM0801	09/12/99	< 5	< 5	< 5	< 5	< 5	< 12	< 12	< 12	< 12	< 12	< 5	< 5	< 1.3
609002 25GLX0201	09/21/99	< 5	< 5	< 5	< 5	< 5	< 10	< 10	< 10	< 10	< 10	< 5	< 5	1.6
609004 25GLX0401	09/21/99	< 5	< 5	< 5	< 5	< 5	< 12	< 12	< 12	< 12	< 12	**130**	< 5	5.5

Notes:

(1) South Carolina Department of Health and Environmental Control Risk-Based Screening Levels for groundwater.

(2) The RBSL for individual PAH CoC is 10 ug/L or 25 ug/L for total PAHs.

(3) Value represents Total Naphthalene (Method 8260 value for naphthalene *plus* Method 8270 value for 2-methylnaphthalene).

Concentrations exceeding RBSL are in bold.

TABLE 9

CURRENT LAND USE - POTENTIAL RECEPTORS AND PATHWAYS WITHIN 1,000-FOOT RADIUS
SITE 25, BUILDING 1346
ZONE F, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Media (for exposure)	Exposure Route	Pathway Selected for Evaluation? (Yes or No)	Exposure point or Reason for Non-Selection	Data Requirements (If pathway selected)
Air	Inhalation Explosion Hazard	No No	No volatilization to enclosed space. No explosion hazard.	
Ground-Water	Ingestion Dermal Contact Volatile Inhalation	No No No	No water supply well downgradient. All water is supplied by city. However, construction worker could be exposed to groundwater in utility trench.	RBSLs for construction worker exposed to groundwater.
Surface Water	Ingestion Dermal Contact Volatile Inhalation	No No No	Cooper River is 1700 feet to the east (upgradient). No complete pathway.	
Surficial Soil	Ingestion Dermal Contact Volatile Inhalation Leaching to Groundwater	No No No No	No impacted surface soil. Asphalt and concrete cover impacted soil.	
Subsurface Soil	Ingestion Dermal Contact Volatile Inhalation Leaching to Groundwater	No No No No	Construction worker in a utility trench could be exposed to contaminated soil and soil vapors. Sandy soils; groundwater is shallow: ~5 feet bls.	

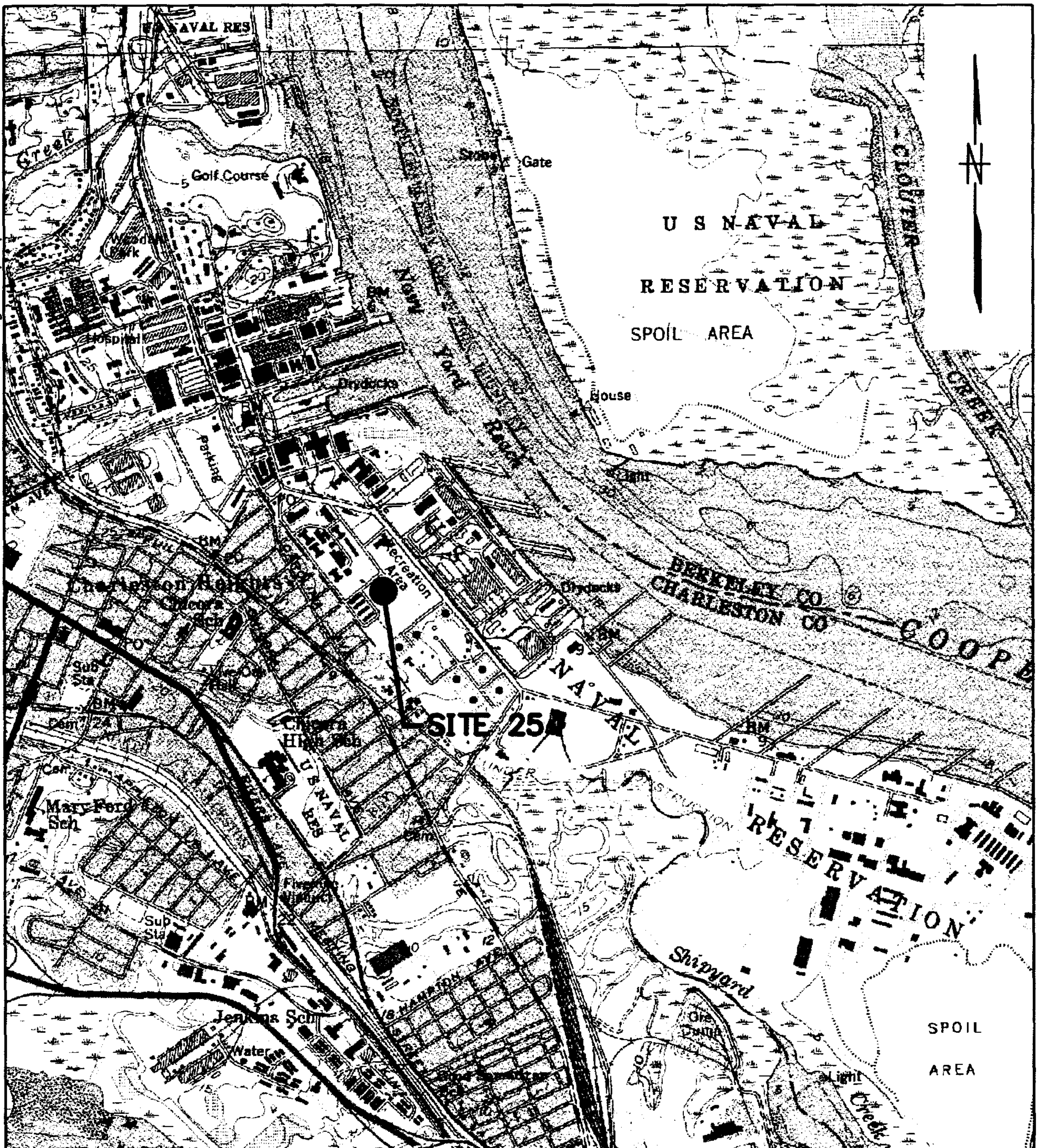
TABLE 10

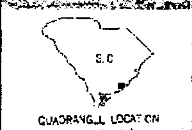
FUTURE LAND USE - POTENTIAL RECEPTORS AND PATHWAYS WITHIN 1,000-FOOT RADIUS
SITE 25, BUILDING 1346
ZONE F, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

Media (for exposure)	Exposure Route	Pathway Selected for Evaluation? (Yes or No)	Exposure point or Reason for Non-Selection	Data Requirements (If pathway selected)
Air	Inhalation Explosion Hazard	No No	No volatilization to enclosed space. No explosion hazard.	
Ground-water	Ingestion Dermal Contact Volatile Inhalation	Yes Yes Yes	No water supply well downgradient. All water is supplied by city. However, construction worker could be exposed to groundwater in utility trench.	RBSLs for construction worker exposed to groundwater.
Surface Water	Ingestion Dermal Contact Volatile Inhalation	No No No	Cooper River is 1700 feet to the east (upgradient). No complete pathway.	
Surficial Soil	Ingestion Dermal Contact Volatile Inhalation Leaching to Groundwater	No No No No	No impacted surface soil. Asphalt and concrete cover impacted soil.	
Subsurface Soil	Ingestion Dermal Contact Volatile Inhalation Leaching to Groundwater	Yes Yes Yes Yes	Construction worker in a utility trench could be exposed to contaminated soil and soil vapors. Sandy soils; groundwater is shallow: ~5 feet bls.	

FIGURES

ACAD:0219CM11.dwg 10/29/99 DT





SOURCE: QUADRANGLE MAP SOUTH CAROLINA, REVISED 1979
QUADRANGLE MAP NORTH CHARLESTON REVISED, 1979

0 2000 4000
SCALE IN FEET

DRAWN BY DATE			CONTRACT NO.	
DLT 10/29/99			0219	
CHECKED BY DATE		SITE LOCATION MAP SITE 25, BUILDING 1346 ZONE F, CHARLESTON NAVAL COMPLEX NORTH CHARLESTON, SOUTH CAROLINA	APPROVED BY DATE	
COST/SCHED-AREA			APPROVED BY DATE	
SCALE AS NOTED			DRAWING NO. FIGURE 1	REV. 0

FORM CADD NO. SDIV_AV.DWG - REV 0 - 1/20/98

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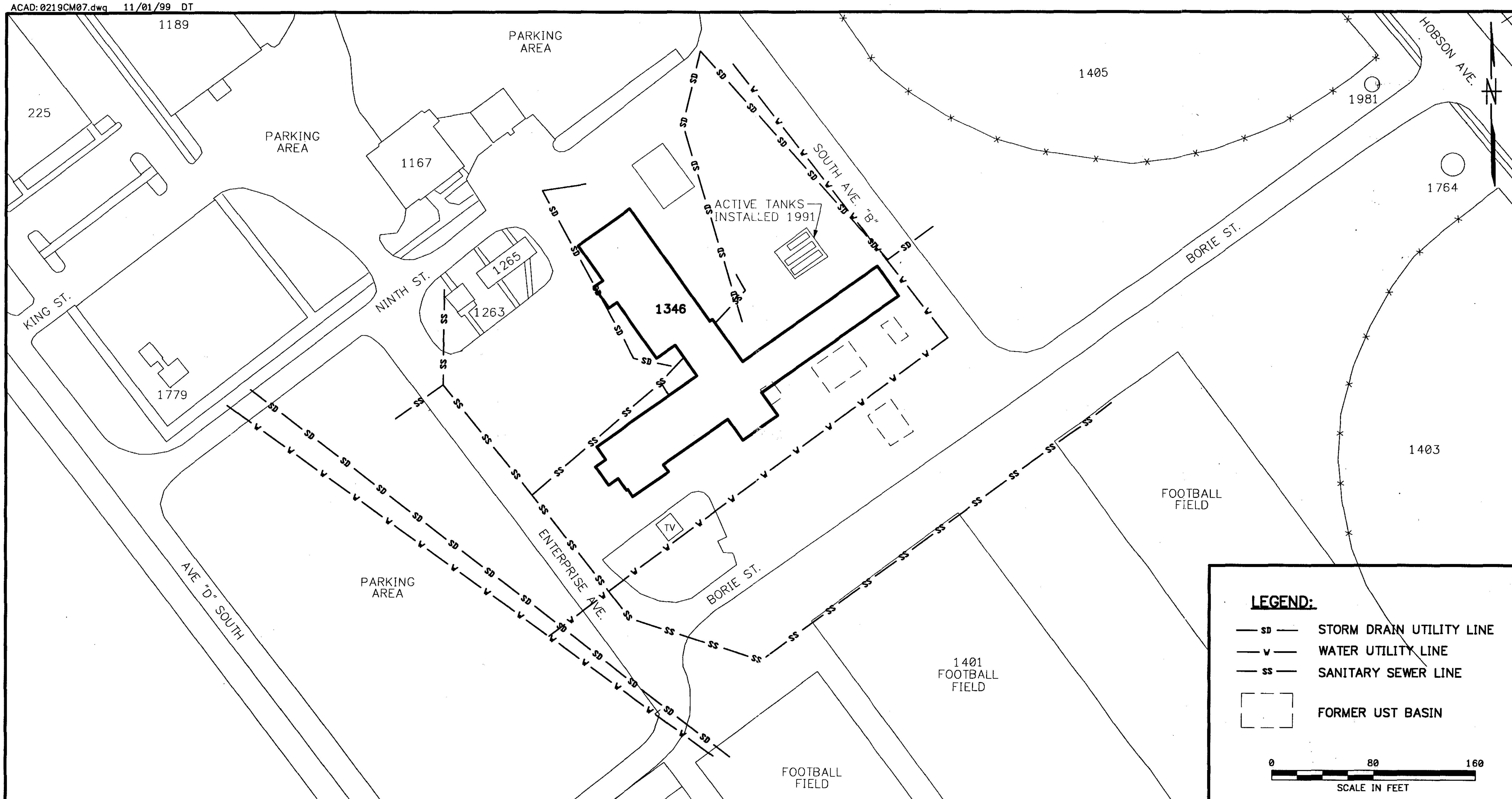

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY DLT DATE 10/29/99

CHECKED BY DATE

COST/SCHED-AREA

SCALE AS NOTED

DEPARTMENT OF THE NAVY — SOUTHERN DIV FACILITIES ENGINEERING COMD

SITE VICINITY MAP
SITE 25, BUILDING 1346
ZONE F, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

CONTRACT NO. 0219

APPROVED BY DATE

APPROVED BY DATE

DRAWING NO. FIGURE 2 REV. 0

FORM CADD NO. SDIV_BH.DWG - REV 0 - 1/20/98

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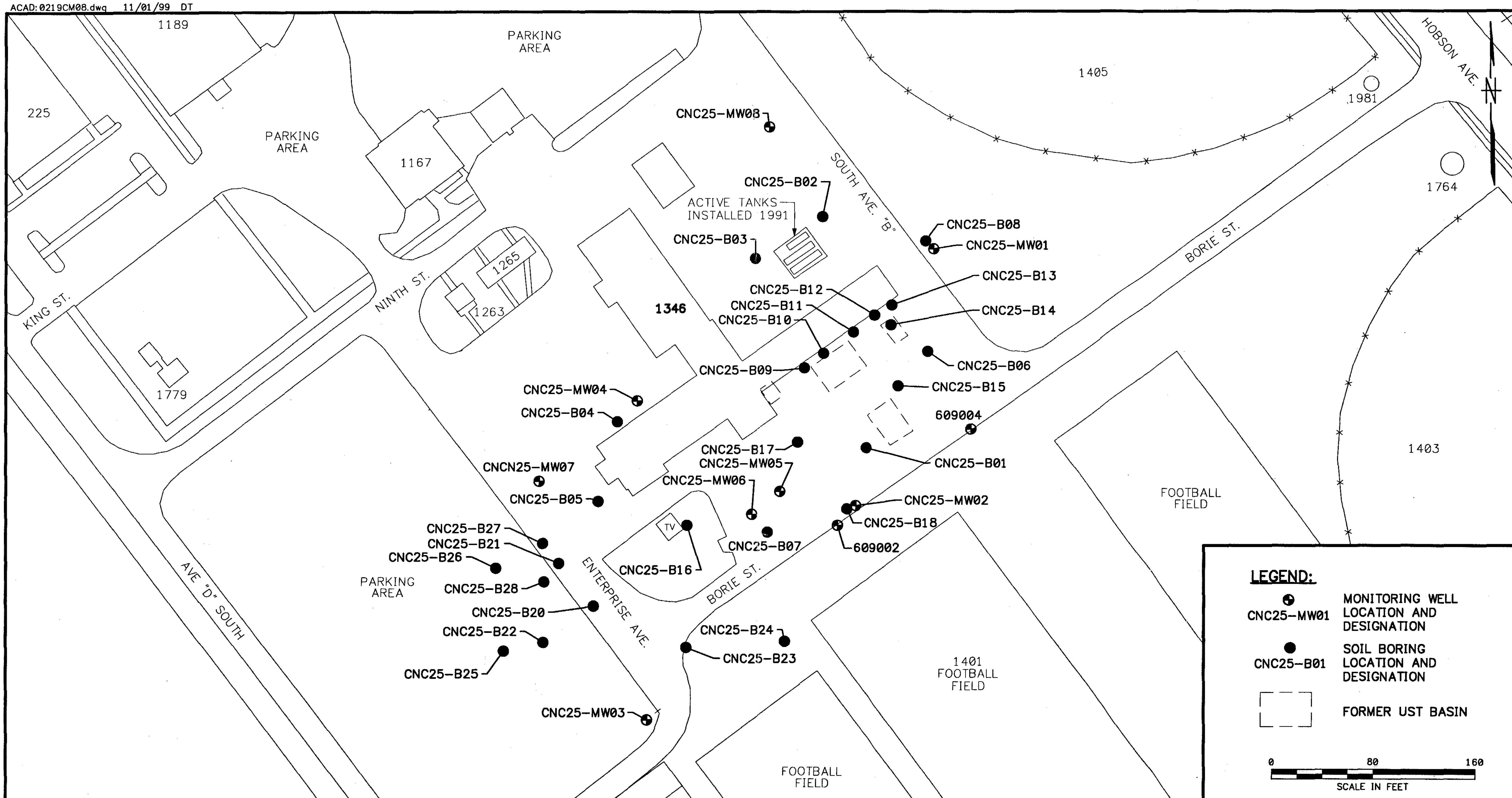


NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

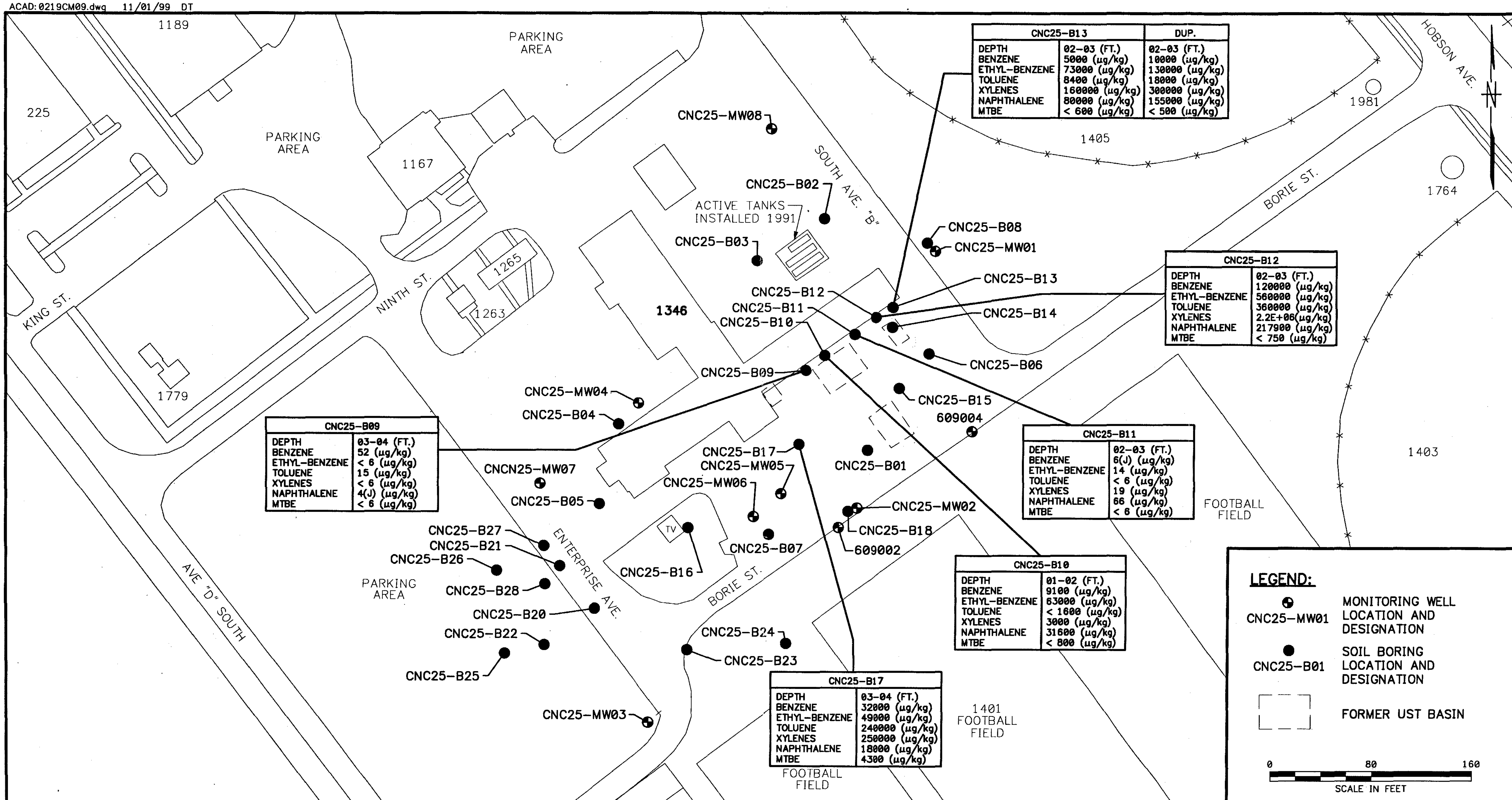
DRAWN BY DLT DATE 10/29/99
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

SITE MAP AND SAMPLING LOCATIONS
SITE 25, BUILDING 1346
ZONE F, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

CONTRACT NO. 0219
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 3 REV. 0

FORM CADD NO. SDIV_BH.DWG - REV 0 - 1/20/98

ACAD: 0219CM09.dwg 11/01/99 DT



NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY DLT DATE 10/29/99
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

DEPARTMENT OF THE NAVY · SOUTHERN DIV FACILITIES ENGINEERING COMD

SOIL CoC MAP
SITE 25, BUILDING 1346
ZONE F, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

CONTRACT NO. 0219
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 4 REV. 0

FORM CADD NO. SDIV_BH.DWG - REV 0 - 1/20/98

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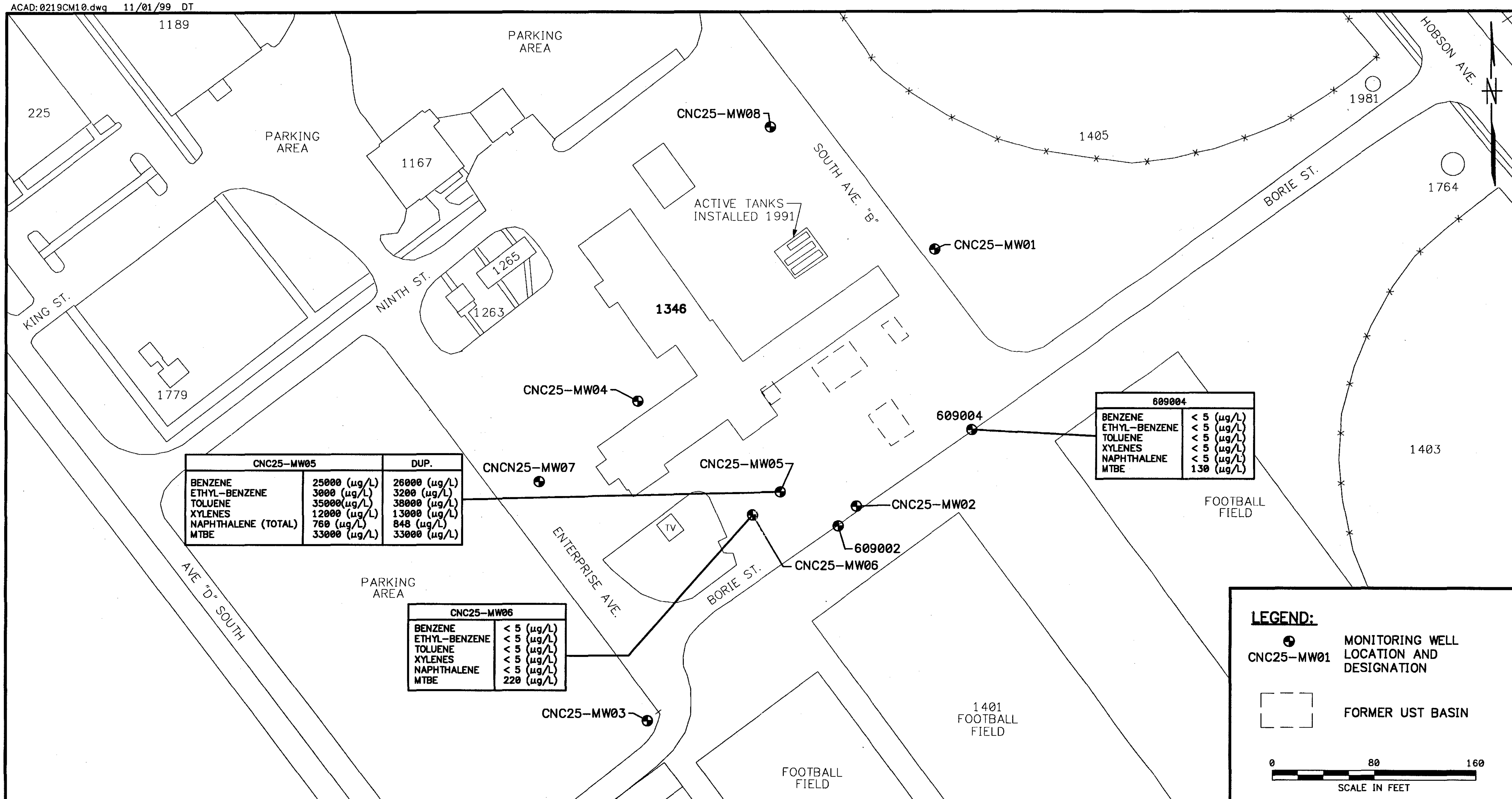

CNC25-MW05		DUP.
BENZENE	25000 (µg/L)	26000 (µg/L)
ETHYL-BENZENE	3000 (µg/L)	3200 (µg/L)
TOLUENE	35000(µg/L)	38000 (µg/L)
XYLENES	12000 (µg/L)	13000 (µg/L)
NAPHTHALENE (TOTAL)	760 (µg/L)	848 (µg/L)
MTBE	33000 (µg/L)	33000 (µg/L)

609004	
BENZENE	< 5 (µg/L)
ETHYL-BENZENE	< 5 (µg/L)
TOLUENE	< 5 (µg/L)
XYLENES	< 5 (µg/L)
NAPHTHALENE	< 5 (µg/L)
MTBE	130 (µg/L)

CNC25-MW06	
BENZENE	< 5 (µg/L)
ETHYL-BENZENE	< 5 (µg/L)
TOLUENE	< 5 (µg/L)
XYLENES	< 5 (µg/L)
NAPHTHALENE	< 5 (µg/L)
MTBE	220 (µg/L)

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY DLT DATE 10/29/99
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

DEPARTMENT OF THE NAVY ★ SOUTHERN DIV FACILITIES ENGINEERING COMD ★

GROUNDWATER CoC MAP
SITE 25, BUILDING 1346
ZONE F, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

CONTRACT NO. 0219
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 5
REV. 0

FORM CADD NO. SDIV_BH.DWG - REV 0 - 1/20/98

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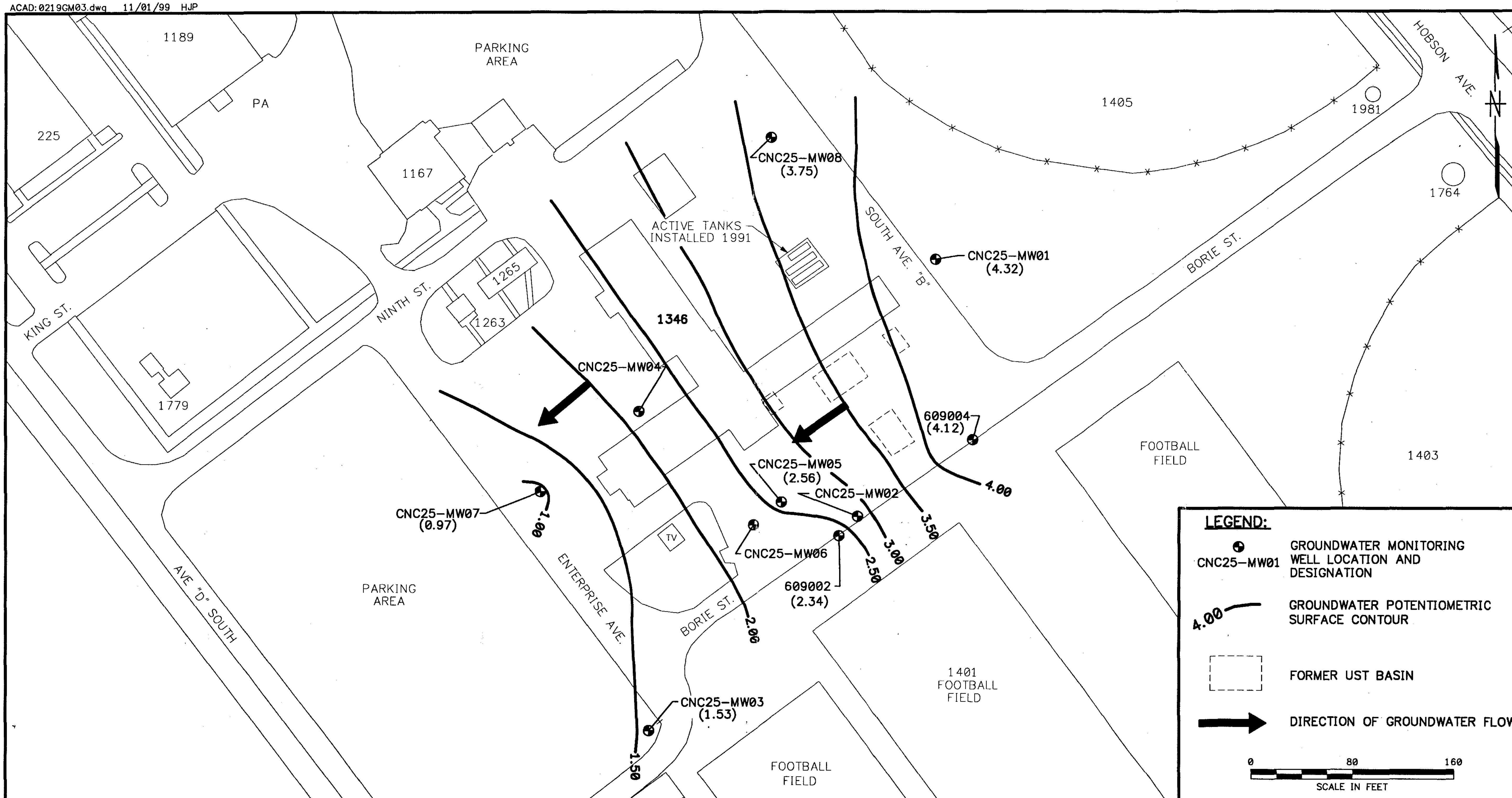

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY HJP DATE 11/1/99
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

DEPARTMENT OF THE NAVY - SOUTHERN DIV FACILITIES ENGINEERING COMD

GROUNDWATER POTENTIOMETRIC SURFACE MAP (SEPTEMBER 11, 1999) SITE 25, BUILDING 1346 ZONE F, CHARLESTON NAVAL COMPLEX NORTH CHARLESTON, SOUTH CAROLINA

CONTRACT NO. 0219
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 6 REV. 0

FORM CADD NO. SDIV_BH.DWG - REV 0 - 1/20/98

APPENDIX A

GEOLOGIC BORING LOGS
FIELD SAMPLING DATA SHEETS

BORING LOG

PROJECT NAME: Zone I
BORING NUMBER: CNC25BØ1
PROJECT NUMBER:
DATE: 6 5 99
DRILLING COMPANY: Columbia
GEOLOGIST: RH
DRILLING RIG: Geoprobe 54ØØ
DRILLER: Brad Lewis

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**	
	1			1.0			asphalt 3"							
	2						Lime Rock Subb							
	3						Orange & Gray sandy Clay		Product odor	58	5		0	HS w/Fil. = 470
0811	4		3.8'						Sampled Soil from 3.0-4.0					HS w/Fil. = 2800
	5								# 25SFBØ10506					
	6								Time 0811					
	7			7.0			Greenish Gray f. to med							
0815	8			Δ 8.0			sand w/clay Moist			58	4		0	H.S. w/Fil. = 7500
	9						Gray f. Sand Wet		Set Screen					HS w/Fil = 2000
	10								from 9.0'-12.0'					
0824	11			11.0			Orange & Gray Sandy		# 25GFBØ10912					
	12			12.0			Clay Moist		Time: Ø830					
	13			B.T.										
	14						W/L = 8.9							

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes ____ No ____ Well I.D. #: ____

BORING LOG

PROJECT NAME: Site 25
PROJECT NUMBER:
DRILLING COMPANY: Columbia
DRILLING RIG: Geoprobe 5400

BORING NUMBER: CNC25B002
DATE: 6-5-99
GEOLOGIST:
DRILLER: B. Lewis

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**	
		1			1.0			Asphalt 3"		Sampled Soil					
		2			2.0			Lime Rock		from 2.0'-3.0'					
		3						Greenish gray sandy clay w/shells		#25SFB020203					
0850		4		2.5				Greenish gray clayey			3	0	·	0	HS w/o fil = 50 ppm
		5						med. to coarse sand		Moist					HS w/fil = 45 ppm
		6			6.0			w/shells frag.							
		7			∆			wet							
0853		8									4	0		0	HS w/o fil = 8 ppm
		9													HS w/fil = N/A
		10													
		11						W/L = 3.5		Set Screen					
		12			12.0					from 8.0'-11.0'					
					B.T.										
										Sampled Water					
										from 8.0'-11.0'					
										#25GFD020811					
										Time : 0900					

* When rock coring, enter rock brokeness.
** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes ____ No ____ Well I.D. #:

BORING LOG

Page ___ of ___

PROJECT NAME: Site 25
BORING NUMBER: CNC25B03
PROJECT NUMBER:
DATE: 6-5-97
DRILLING COMPANY: Columbia
GEOLOGIST:
DRILLING RIG: Geoprobe 5400
DRILLER: B. Lewis

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	U S C S *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**	
				1.0			Asphalt 3"							
				2.0			Lime Rock							
							Greenish Gray clayey							
0913	4		1.0	4.0			f. sand-		Sampled Soil					H.S. w/fil = 60ppm
							Dark Gray Silty		from 4.0'-5.0'					H.S w/fil = 42ppm
							clay (moist)		#25SFB030405					
									Time: 0915					
0915	8		4.0											H.S w/fil = 15ppm
														H S w/fil = 12ppm
				11.0			w/L = 4.1'		Set Screen					
				B.T					from 8.0'-11.0'					
									Sampled Water					
									#25GFB030811					
									Time: 0925					

* When rock coring, enter rock brokeness.

' Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ______

Remarks: ______

Converted to Well: Yes ______ No ______ Well I.D. #: ______

BORING LOG

Page ___ of ___

PROJECT NAME: Site 25
PROJECT NUMBER:
DRILLING COMPANY: Columbia
DRILLING RIG: Geoprobe 5400
BORING NUMBER: CNC25B04
DATE: 6-5-99
GEOLOGIST:
DRILLER: B. Lewis

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	Sample	Sampler BZ	Borehole**	Driller BZ**
				.9			Asphalt		Sampled Soil				
							Lime Rock		from 2.0'-3.0'				
							6" Layer of Sandy Clay		# 25SFB040203		0		0
0945	4			4.0			3" Layer of Asphalt.		Time @ 0945				
				Δ			4" Layer of Sandy clay						
							2" " of Asphalt						
						4'	Tan f. to med Sand						
947	8			8.0			(wet)				0		0
				B.T.			W/L 26.7'		Set Screen				
									from 5.0'-8.0'				
									Sampled Water				
									# 25GFB040508				
									Time @ 0955				

H.S. w/ fil. = 0 ppm
H.S. w/ fil. = N/A

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes ___ No ___ Well I.D. #:

BORING LOG

PROJECT NAME: Site 25
BORING NUMBER: CNC25BØ5
PROJECT NUMBER:
DATE: 6-5-99
DRILLING COMPANY: Columbia
GEOLOGIST:
DRILLING RIG: Geoprobe 540
DRILLER: B. Lewis

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
				.5			Asphalt 0.5'		s				
							Orange & gray sandy		Product Odor				
							clay						
1002	4		2.3						Sampled soil		0		0
									from 4.0'-5.0'				
				6.0			Gray sandy Clay. Moist		# 25SFBØ50405				
									Time: 1007				
008	8		2.8	7.5			Gray silty/clayey Coarse		Product Odor		0		0
							sand, Moist						
				11.0			W/L = 9.3'						
				B.T.									
									Set Screen				
									from 8.0'-11.0'				
									Sampled Water				
									# 25GFBØ50811				
									Time: 1019				

H.S. w/ 6fil = 170 pp
H.S. w/ 8fil = 120 pp
H.S. w/ 8fil = 130 pp
H.S. w/ fil = 50 pp

* When rock coring, enter rock brokeness.

* Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes ____ No ____ Well I.D. #:

BORING LOG

Page ___ of ___

PROJECT NAME: Site 25
PROJECT NUMBER:
DRILLING COMPANY: Columbia
DRILLING RIG: Geoprobe 5400

BORING NUMBER: CNC25BØK
DATE: 6-5-99
GEOLOGIST:
DRILLER: B. Lewis

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	U S C S *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**	
					.8			Asphalt .3		Sampled Soil					
								Lime Rock		from 4.0-5.0					
								Greenish Gray silty Clay		# 255FBØ6Ø4Ø5					H.S. w/fil = 1400
532		4		2.0						Time: 1034					HS w/fil = 280 pp
					5.5			Gray silty, clay coarse		~~Moist Soil~~					
					6.5			sand wet		wet					H.S w/fil = 700 ppm
1034		8		3.0	7.5			Greenish Gray silty Clay		moist					HS w/fil = 160 pp
								Red & Gray sandy clay							
								Tr. of Silt (Moist)		Set Screen					
										from 8.0'-11.0'					
					12.0			W/L = 9.2'							
					B.T.					Sampled Water					
										# 25GFBØ6Ø871					
										Time: 1045					

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes ____ No ____ Well I.D. #: ____

BORING LOG

Page ___ of ___

PROJECT NAME: Site 25
PROJECT NUMBER:
DRILLING COMPANY: Columbia
DRILLING RIG: Geoprobe 5400
BORING NUMBER: CNC25BØ7
DATE: 6-5-99
GEOLOGIST:
DRILLER: B. Lewis

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
				.4			Asphalt= .4		Sampled Soil				
							Brown sandy Clay		from 6.0'-7.0'				
									Time: 1102				
059	4		2.2				Red & Gray Sandy Clay						
							Tr. of Silt						
				6.5			Greenish gray sandy						
102	8						clay Moist						
	12			12.0'			W/L = 10.0'		Set Screen				
				B.T.					from ~~9~~ 9.0'-12.0'				
									Sampled Water				
									from 9.0'-12.0'				
									# 25GFBØ70912				
									Time: 1118				

1.0'-2.0'
HS w/fil = 180 ppb
HS w/o fil =

6.0'-7.0'
HS w/fil = 380 ppb
HS w/o fil =

* When rock coring, enter rock brokeness.
** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: ____________

Drilling Area Background (ppm): ____

Converted to Well: Yes ____ No ____ Well I.D. #: ____

BORING LOG

PROJECT NAME: Site 25
PROJECT NUMBER:
DRILLING COMPANY: Columbia
DRILLING RIG: Geoprobe 5400

BORING NUMBER: CNG25B08
DATE: 5-5-99
GEOLOGIST:
DRILLER: B. Lewis

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	Sample	Sampler BZ	Borehole**	Driller BZ**	
					1.0			Brown clay fine							
								Sand w/ Roots		Sampled Soil					3.0'-4.0'
					2.5			Brown Sand & clay		from 3.0'-4.0'					~~4.0'-5~~
236		4						Greenish Gray silty		# 25SFB080504					H.S. w/ Fil = 300
					4.5			clay		Time @ 1236					H.S. w/ Fil = 160
					~~X~~			No Recovery							
238		8		0.5											
										Set Screen					
										from ~~8.0'-11.0'~~					
					11.0			W.L = 7.4		~~8.0'-8.0'~~					
					B.T.					4.0'-7.0'					
										Sampled Water					
										# 25GFB080408					
										Time @ 1525					

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes ____ No ____ Well I.D. #:

BORING LOG

Page ___ of ___

PROJECT NAME: Site 25
PROJECT NUMBER:
DRILLING COMPANY: Columbia
DRILLING RIG:

BORING NUMBER: CNC25BØ9
DATE: 6-7-99
GEOLOGIST:
DRILLER: R. Brand

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
				1.0			Asphalt .3						
							Subbase		sampled soil				
							Brown/Gray silty,		from 3.0'-4.0'				
	4		2.5				sandy clay		# 25SLBØ9Ø3Ø4				
				5.0					Time 0858				
				6.0			Moist						
				▽									
	8			8.0			Gray/tan. Clay/sand						
							gravel wet						

H.S w/ Fil = 12 ppm
H.S w/ Fil = 14 pp

* When rock coring, enter rock brokeness.
** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes ______ No ______ Well I.D. #:

BORING LOG

Page ___ of ___

PROJECT NAME: Site 25
PROJECT NUMBER:
DRILLING COMPANY: Columbia
DRILLING RIG:
BORING NUMBER: CNC25B10
DATE: 6-7-99
GEOLOGIST:
DRILLER: R. Brand.

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	U S C S *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
				1.0			Asphalt .3		Sampled Soil				
							Sub base		from 1.0-2.0				
							Tan & Gray silty clay		# 25SLB10010?				
	4		2.5	3.5 Δ			Tr. of Sand		Time @ 0915				
							Tan & Gray clay & Sand						
							Very Moist						
	8		2.0	8.0									
				B.T.									

H.S w/o Fil = 7500
HS w/ Fil = 140

* When rock coring, enter rock brokeness.
** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: ______

Drilling Area Background (ppm): ______

Converted to Well: Yes ______ No ______ Well I.D. #: ______

BORING LOG

Page ___ of ___

PROJECT NAME: Site 25
PROJECT NUMBER: ______
DRILLING COMPANY: ______
DRILLING RIG: ______

BORING NUMBER: CNC25B11
DATE: 6-7-99
GEOLOGIST: ______
DRILLER: R. Brand

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
							Asphalt .3		Sampled Soil				
				1.5 / 2.0			Sub base		from ~~0~~2.0-3.0				
							Br. clayey sand.		# 25SB11Ø2Ø3				
	4		2.2				Gray coarse sand.						
				5.0 / Δ			Wet						
	8		3.0	8.0									
				B.T.									

H.S. w/o Fil = 170
H.S. w/Fil = 90

* When rock coring, enter rock brokeness.
** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: ______

Drilling Area Background (ppm): ______

Converted to Well: Yes ______ No ______ Well I.D. #: ______

BORING LOG

PROJECT NAME: Site 25
BORING NUMBER: CNC25B12
PROJECT NUMBER:
DATE: 6-7-94
DRILLING COMPANY: Columbia
GEOLOGIST:
DRILLING RIG:
DRILLER: R. Brand

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
				1.0			Asphalt .2		Sampled Soil				
							Sub. Base		from 2.0-3.0'				
							Gray silty clay w/layers		#25SLB120203				
	4		2.5	3.5			of Med. sand		Time: 1015				
							Gray f. to med sand						
							Tr clay Wet						
							↓						
	8		3.0'	8.0									
				B.T.									

H.S. w/F.I = 7500
H.S. w/F.I = 210

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes ____ No ____ Well I.D. #:

BORING LOG

PROJECT NAME: Site 25
BORING NUMBER: CNC25B13
PROJECT NUMBER:
DATE: 6-7-04
DRILLING COMPANY: Columbia
GEOLOGIST:
DRILLING RIG:
DRILLER: R. Brand

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	U S C S *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**	
				1.0			Asphalt .3		Sampled Soil					
							Sub base		from 2.0'-3.0'					
				3.0			Brown clayey Sand		# 25SLB130203					H.S w/ Fil = >500
	4		2.5	Δ			Tr. gravel		Time: 1040					H.S w/ Fil = 700
							Grey f. to med Sand							
							Wet							
	8		2.8											
									Duped # 25SLB130203					

* When rock coring, enter rock brokeness.
** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: ______

Drilling Area Background (ppm): ______

Converted to Well: Yes ______ No ______ Well I.D. #: ______

BORING LOG

Page ___ of ___

PROJECT NAME: Site 25
PROJECT NUMBER:
DRILLING COMPANY: Columbia
DRILLING RIG:

BORING NUMBER: CNC25B14
DATE: 6-7-99
GEOLOGIST:
DRILLER: R. Brand

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	U S C S *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
							Asphalt .2		Sampled Soil				
				1.5			Sub base		from Ø3Ø4				
							Light Grey F. to med		# 25SLB14Ø8Ø4				
	4		2.8				Sand Moist		Time 1055				
				5.0									
				Δ			wet						
	8		2.3	8.0									
				B.T.									

H.S. w/o Fil = 900
H.S w/ Fil = 80

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: ______________________

Drilling Area Background (ppm): [ ]

Converted to Well: Yes ______ No ______ Well I.D. #: ______

BORING LOG

Page ___ of ___

PROJECT NAME: Site 25
BORING NUMBER: 8 CNC25 B15
PROJECT NUMBER:
DATE: 6-7-99
DRILLING COMPANY: Columbia
GEOLOGIST:
DRILLING RIG:
DRILLER: R. Brand

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
				1.0			Asphalt .2		Sampled Soil				
							Sub base		from 3.0'-4.0'				
							Orange & Grey fi to med		# 25SLB15030304				
	4		2.7	4.0			Sand Tr. of gravel		Time: 1115				
				B.T.									

* When rock coring, enter rock brokeness.
** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: ______

Drilling Area Background (ppm): ______

Converted to Well: Yes ______ No ______ Well I.D. #: ______

BORING LOG

Page ___ of ___

PROJECT NAME: ~~ENGAS~~ Site 25
BORING NUMBER: CNC25B16
PROJECT NUMBER:
DATE: 6-7-99
DRILLING COMPANY: Columbia
GEOLOGIST:
DRILLING RIG:
DRILLER: R. Brand

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
							Br. f. Tr. med. Sand.		sampled soil				
				2.0					from 3.0'-4.0'				
							Orange & Grey sandy		#25SLB160304				
1330	4		3.0	4.0			clay Tr. of Silt.		Time @ 1330				
				B.T.									

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: ______________________

Drilling Area Background (ppm): ____

Converted to Well: Yes ______ No ______ Well I.D. #: ______________

BORING LOG

Page ___ of ___

PROJECT NAME: Site 25
PROJECT NUMBER:
DRILLING COMPANY: Columbia
DRILLING RIG:

BORING NUMBER: CNC25B47
DATE: 6-7-99
GEOLOGIST:
DRILLER: R. ~~Band~~ Bond

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
				1.0			Asphalt .2'						
							subbase						
							Orange & Gray sandy						
1353	4			4.0			clay Tr. of silt.						
				BT.									

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes ______ No ______ Well I.D. #:

BORING LOG

PROJECT NAME: CMC
BORING NUMBER: ZSB18
PROJECT NUMBER:
DATE: 6/14/99
DRILLING COMPANY: Columbia
GEOLOGIST:
DRILLING RIG: Stratoprobe
DRILLER: A. Brand

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	Sample	Sampler BZ	Borehole**	Driller BZ**
		1					Brn	Silty Sand		Dry				
		2					Grey	Silty Clay		Stiff-Dry				
		3								Moist	120			
		4		4/4							20			
1239	X	5					Olive Grey							
		6												
		7						Sandy Clay		Saturated				
1244		8		4/4										
		9												
		10					Brn & Red							
		11												
		12		4/4			Grey							

* When rock coring, enter rock brokeness

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes Temp No

Well I.D. #:

BORING LOG

PROJECT NAME: CdC

PROJECT NUMBER:

DRILLING COMPANY: Columbia

DRILLING RIG: Stratoprobe

BORING NUMBER: 25B19

DATE: 6/19/99

GEOLOGIST:

DRILLER: R. Brand

Sample No. and Type or RQD	Depth (Ft) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	1					Reddish Brown	Silty Clay		Dry				
	2												
X	3									0			
1306	4		3/4										
	5					Light Gray			Moist				
	6								Saturated				
	7									75,000			
1310	8		4/4			Gray	Clayey Sand - Petro Odor						
	9												
	10												
	11												
	12		/4										

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes Temp No

Well I.D. #:

BORING LOG

PROJECT NAME: CNC
PROJECT NUMBER:
DRILLING COMPANY: Columbia
DRILLING RIG: Strataprobe

BORING NUMBER: 25B26
DATE: 6/14/99
GEOLOGIST:
DRILLER: R. Brand

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	1						Asphalt w/Base		Dry				
	2					Reddish Brown	Sandy Clay		↓	240			
	3												
1342 x	4		2/4							120			
	5								Moist				
	6					↓	↓						
	7					Gray	Sandy Clay		Saturated				
1335	8		4/4				Clayey Sand						
	9												
	10												
	11												
	12		/4										

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes Temp No Well I.D. #:

BORING LOG

PROJECT NAME: CW ~
BORING NUMBER: ZSB21
PROJECT NUMBER:
DATE: 7/8/99
DRILLING COMPANY: Columbia
GEOLOGIST:
DRILLING RIG: Strataprobe
DRILLER: R. Brand

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	PID/FID Reading (ppm): Sampler BZ	PID/FID Reading (ppm): Borehole	PID/FID Reading (ppm): Driller BZ
	1						Asphalt w/base						
	2			Hand Auger		Brn	Sand		Dry				
	3					Reddish Brn	Sandy Clay			30	0	1,400	0
	4												
X	5									60	0		0
	6								Moist				
	7					Green			Saturated				
	8		3/3				Stiff						

* When rock coring, enter rock brokeness.
** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes Temp No ______ Well I.D. #:

BORING LOG

PROJECT NAME: CNC

PROJECT NUMBER:

DRILLING COMPANY: Columbia

DRILLING RIG: hand auger/ Stratoprobe

BORING NUMBER: 25B ~~2~~ 22

DATE: 7 8 99

GEOLOGIST: R Franklin

DRILLER: R Brand

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	1			Hand Auger		br	sand		dry				
	2					red	sandy clay		dry				
	3				Orange					0	0	0	0
	4												
	5				gray mottled								
X	6						clayey sand		moist	0	0	0	0
X	7												
	8		3/3										

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes Temp No ______ Well I.D. #:

BORING LOG

PROJECT NAME: Zone F
PROJECT NUMBER: Site 25
DRILLING COMPANY: Columbia
DRILLING RIG: hand auger / Stratoprobe
BORING NUMBER: CNC25B23
DATE: 7 8 96
GEOLOGIST: R Franklin
DRILLER: R Brand

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ
	1			Hand Auger		br	clay (crumbles)		Dry				
	2												
	3									0	0	0	0
	4												
	5					Gray	Silty Clay - Soft		Moist				
X	6												
	7					Blk	Stiff			0	7	0	0
	8		2/4										
	9								Saturated				
	10					Olive Brn	Sandy Clay						
	11												
	12		3/4										

* When rock coring, enter rock brokeness.
** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes Temp No ____ Well I.D. #: ____

BORING LOG

PROJECT NAME: CNC
BORING NUMBER: 25B24
PROJECT NUMBER:
DATE: 7 8 99
DRILLING COMPANY: Columbia
GEOLOGIST:
DRILLING RIG: hand auger
DRILLER: Randy Regal

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ
	1			hand auger		br	sand		dry				
	2					br	clayey sand		moist				
	3				red/gray		clayey sand			0	0	0	0
	4				mottled								
	5												
X	6						Sandy Clay			0	0	0	0
	7												
	8		3/3						Saturated				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes Temp No ______ Well I.D. #:

BORING LOG

PROJECT NAME: CMC
BORING NUMBER: 25B25
PROJECT NUMBER:
DATE: 7/24/98
DRILLING COMPANY: Columbia
GEOLOGIST:
DRILLING RIG: Strataprobe
DRILLER: [illegible]

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	1			Hand Auger			Asphalt w/base		Dry				
	2					Brn	Sandy Fill						
	3												
	4					Gray	Sandy Clay						
N	5					Reddish Gray			Moist	0	0	0	0
	6												
	7					Olive Gray	Clayey Sand		Saturated				
	8		4/4										

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes Temp No ______ Well I.D. #:

BORING LOG

PROJECT NAME: CWR
PROJECT NUMBER:
DRILLING COMPANY: Columbia
DRILLING RIG: Strataprobe

BORING NUMBER: ZSB26
DATE: 7/24/94
GEOLOGIST:
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	Sample	Sampler BZ	Borehole**	Driller BZ**
	1						Asphalt w/ base,						
	2					Brn	Clayey Sand		Dry				
	3												
	4								Moist	0	0	0	0
	5												
	6					Red Orange	Silty Clay /		Saturated				
	7						~~Silty Clay~~ Clayey Sand						
	8		4/4										

MATERIAL DESCRIPTION; PID/FID Reading (ppm)

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes Temp No Well I.D. #:

BORING LOG

PROJECT NAME: CWC
PROJECT NUMBER:
DRILLING COMPANY: [illegible]
DRILLING RIG: Stratoprobe
BORING NUMBER: 25BZ7
DATE: 8/3/94
GEOLOGIST:
DRILLER: R. Brand

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	1						Asphalt w/ Base						
	2					Red	Clayey Sand		Dry				
	3									190	0	25	0
	4					Olive	Sandy Clay - Stiff			70	0	25	0
	5					Red &	Clayey Sand						
	6					Brown			Moist				
	7								Saturated				
	8					Green	Silty Sand						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes Temp No ______ Well I.D. #:

BORING LOG

PROJECT NAME: CNC
BORING NUMBER: 25B28
PROJECT NUMBER:
DATE: 8/3/99
DRILLING COMPANY: Columbia
GEOLOGIST:
DRILLING RIG: Strataprobe
DRILLER: A. Brand

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	1						Asphalt						
	2					Red	Clayey Sand		Dry				
X	3									0	0	0	0
	4												
	5												
	6					[illegible]			Saturated				
	7					Gray	~~Sa~~ Sandy Clay						
	8					Brown	Silty Sand						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes Temp No Well I.D. #:

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: CNC25
Project No.: 2219

[] Surface Soil
[✓] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 35SLB090304
Sample Location: B09
Sampled By:
C.O.C. No.:

Type of Sample:
[] Low Concentration
[✓] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 6-7-99 Time: 0858 Method: DPT Monitor Reading (ppm): 106	3.0'-4.0'	Red & Gray	Red & Gray Sandy, Silty Clay Moist

COMPOSITE SAMPLE DATA:

	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 6-7-99		0	.3	Asphalt.
Method: DPT		.3	1.0	Sub Base
		1.0	5.0	Red & Gray silty Sandy Clay.
Monitor Readings		5.0	6.0	" " " " " Moist
(Range in ppm):		6.0	8.0	Gray & Tan Clay sand & gravel Wet
w/o F.I.=120				
w/ F.I.=14 ppm				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
BTEX/EDB	4 encore	6-7-99	
Lead	1-4 oz jar		
PAH	1-4 oz jar		

OBSERVATIONS / NOTES:

Total Depth = 12.0'

MAP:

Circle if Applicable:

MS/MSD | Duplicate ID No.:

Signature(s):

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: CNC 25
Project No.: 0219

Sample ID No.: ~~GNC~~25 B1Ø1Ø2
Sample Location: B1Ø
Sampled By:
C.O.C. No.:

[] Surface Soil
[✓] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[✓] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 6-7-99 Time: 0915 Method: DPT Monitor Reading (ppm):	1.0-2.0	Tan & Gray	silty clay Tr. Sand -

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
6-7-99	0908	0	.3	Asphalt
Method:		.3	1.0	Sub base
DPT		1.0	3.5	Tan & Gray silty clay Tr. sand
Monitor Readings		3.5	7.0	Tan & Gray Clay & Sand. Very Moist
(Range in ppm):				
w/o Fil = 75000				
w/ Fil = 140				Total

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
BTEX / EDB	4 - encore	6-7-99	
PAH	1- 4oz jar	↓	
Lead	1- 4oz jar		

OBSERVATIONS / NOTES:

Total Depth = 8.0'

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: CNC 25
Project No.: 0219

Sample ID No.: 25SLB11Ø2Ø3
Sample Location: B11
Sampled By: RF
C.O.C. No.:

- [] Surface Soil
- [x] Subsurface Soil
- [] Sediment
- [] Other:
- [] QA Sample Type:

Type of Sample:
- [] Low Concentration
- [x] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 6-7-99 Time: 0935 Method: DPT Monitor Reading (ppm): 1610	2.0-3.0	Brown	clayey sand.

COMPOSITE SAMPLE DATA:

	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 6-7-99		0	.3	Asphalt
Method: DPT		.3	1.5	Sub Base
		1.5	2.0	Brown Clayey Sand
Monitor Readings		2.0	5.0'	Gray Coarse sand Moist
(Range in ppm):		5.0'	8.0'	Wet
w/o Fil=7~~5~~800				
w/Fil=90				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
BTEX/EDB	4- Encore	6-7-99	
PAH	1-4 oz Jar	↓	
Lead	1-4 oz Jar		

OBSERVATIONS / NOTES:

0-4' = 2.2 Rec.
4'-8 = 3.0'

Total Depth 12.0' ~~7.0~~

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s): J. O'Neill

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: CNG25
Project No.: 0219

Sample ID No.: 25SLB120303
Sample Location: B12
Sampled By: R.F.
C.O.C. No.:

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[X] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 6-7-99 Time: 1015 Method: DPT Monitor Reading (ppm):	2.0-3.0	Gray	Silty Clay w/layers of Sand.

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
6-7-99	1013	0	.2	Asphalt
Method:		.2	1.0	Sub base
DPT		1.0-3.5	Gray	Silty clay w/layers of med. Sand
Monitor Readings		3.5-8.0	Gray	f. to Med sand Tr Clay Wet
(Range in ppm):				
w/o Fil = 75000				
w/Fil = 210				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
BTEX / EDB	4 - Encore	6-7-99	
PAH	1 - 4oz jar	↓	
Lead	1 - 4oz jar.		
Grain Size	2 - 32oz jars		

OBSERVATIONS / NOTES:

Rec 0'-4' = 2.5
4'-8 = 3.0
Grain Size from 2.0'-3.0' & 7.0'-8.0'

Total Depth. 12.0'

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: CNC25
Project No.: 6219

[] Surface Soil
[✓] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 25SLB130203
Sample Location: B13
Sampled By: RF
C.O.C. No.:

Type of Sample:
[] Low Concentration
[✓] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 6-7-99 Time: 1040 Method: Monitor Reading (ppm):	2.0-3.0	Brown	Clayey Sand Tr. Gravel

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
6-7-99	1032	0-.3		Asphalt
Method: DPT		.3-1.0		Sub base
		1.0-3.0	Brown	~~Br~~ Clayey Sand Tr. gravel
Monitor Readings (Range in ppm):		3.0-8.0	Gray	~~Gray~~ f. to med Sand, wet
w/o Fil = 75000				
w/Fil = 700				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
BTEX/EDB	8 - Encore	6-7-99	
PAH	2 - 4 oz Jars	↓	
Lead	2 - 4 " "		
TPH	2 - 4 " "		
c			

OBSERVATIONS / NOTES:

Rec 0-4' = 2.5'
4-8' = 2.8

Total Depth = 16.0'

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.: 25SLB130203D

Signature(s): J. McNeill

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: CNC25
Project No.: 0219

Sample ID No.: 25SLB140304
Sample Location: BH
Sampled By: RF
C.O.C. No.:

[] Surface Soil
[✓] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[✓] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 6-7-99 Time: 1055 Method: Monitor Reading (ppm):	3.0'-4.0'	Light Gray	Fine to med. Sand

COMPOSITE SAMPLE DATA:

	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 6-7-99		0-.2	Black	Asphalt
		.2-1.5	Gray	Sub base
Method: DPT		1.5-5.0	Light Gray	F. to med Sand. Moist
Monitor Readings (Range in ppm): w/o Fil = 900 w/Fil = 80		5.0-8.0	" "	" " " Wet

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
BTEX / EDB	4 - Encore	6-7-99	
PAH	1-4oz jar	↓	
Lead	1-4oz jar	↓	

OBSERVATIONS / NOTES:

Rec. 0'-4' = 2.8

Total Depth = 8.0

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name:	CNC25	Sample ID No.:	25SLB15Ø3Ø4
Project No.:	Ø219	Sample Location:	B15
		Sampled By:	RF
		C.O.C. No.:	

[] Surface Soil
[✓] Subsurface Soil
[] Sediment
[] Other: ______
[] QA Sample Type: ______

Type of Sample:
[] Low Concentration
[✓] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 6-7-99 Time: 1115 Method: DPT Monitor Reading (ppm): 150	3.0-4.0	Orange & Gray	fine to med. Sand Tr. gravel

COMPOSITE SAMPLE DATA:

	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 6-7-99		0-.2	Black	Asphalt
Method: DPT		.2-1.0		Sub base
		1.0-4.0	Orange & Gray	Fine to Med Sand - Tr. gravel
Monitor Readings (Range in ppm): w/o F.I = 190 w/F.I = 40				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
BTEX/EDB	4 Encore		
PAH	1-4 oz jar		
Lead	1-4 oz jar		
TOC/FOC	2-4 oz jar		

OBSERVATIONS / NOTES:

Rec 0-4 = 2.7

Total Depth 4.0'

MAP:

Duped The TOC/FOC only

Circle if Applicable:

MS/MSD

Duplicate ID No.: TOC/FOC only 25SLB15Ø3Ø4D

Signature(s):

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: CNC25
Project No.: ø219

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 25SLB16ø3ø4
Sample Location: B16
Sampled By: RF
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 6-7-99 Time: 1330 Method: DPT Monitor Reading (ppm):	3.0'-4.0'	Orange&Grey	Sandy clay Tr. of Silt

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
6-7-99	1330	0-2.0	Brown	fine To Med Sand
Method: DPT		2.0'-4.0'	Orange&Grey	sandy Clay Tr. of Silt
Monitor Readings (Range in ppm): w/o Fil = 460; w/Fil = 210				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
BTEX/EDB	4 - Encore	6-7-99	
PAH	1- 4OZ Jar	↓	
Lead	1- " " "		

OBSERVATIONS / NOTES:

Rec 0-4' = 3.0'

Total Depth = 4.0'

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

SOIL & SEDIMENT SAMPLE LOG SHEET

Page ___ of ___

Project Site Name: CNC25
Project No.: 0219

Sample ID No.: 25SLB17Ø3Ø4
Sample Location: B17
Sampled By: R.F.
C.O.C. No.:

[] Surface Soil
[✓] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 6-7-99	3.0'-4.0'		
Time: 1355			
Method: DPT			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
6-7-99	1355	0 - .2		Asphalt
Method:		.2-1.0		Sub base
DPT.		1.0 - 4.0		Orange & Gray sandy Clay tr. silt
Monitor Readings				
(Range in ppm):				
w/o Fil = >5000				
w/Fil = 100				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
BTEX / EDB	4 - Encore	6-7-99	
PAH	1-4 oz Jar	↓	
Lead	1-4 oz Jar	↓	

OBSERVATIONS / NOTES:

Rec 0'-4.5 = 3.6'

Total Depth = 4.0'

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s): [signature]

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Zone F
Project No.: 0219

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 25GLM0101
Sample Location: CNC25MW1
Sampled By: JA/JE
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Date: 9-21-99	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	%	NA
Time: 1205								
Method: Peristaltic	clear	6.50	1.04	25.9	-10	0.21	—	

PURGE DATA:

Date: 9 21 99	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Peristaltic	Initial	6.40	.788	24.9	-10	1.04		
Monitor Reading (ppm): —	1	6.66	.796	25.5	-10	2.54		
Well Casing Diameter & Material	2	6.52	0.94	26.0	-10	0.48		
Type: 2" PVC	3	6.55	0.99	26.3	-10	0.97		
Total Well Depth (TD): 11.02	4	6.50	1.04	25.9	-10	0.21		
Static Water Level (WL): 1.23								
One Casing Volume(gal/L): 1.6								
Start Purge (hrs): 1045								
End Purge (hrs): 1200								
Total Purge Time (min): 75 min								
Total Vol. Purged (gal/L): ~4.5 gal								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL Volatiles	HCl/4°C	(3) 40 mL vials	yes
Dissolved Methane	HCl/4°C	(3) 40 mL vials	
Lead	HNO3/4°C	(1) 250 mL plastic	
PAHs	4°C	(2) 1 L Amber	
Anions	4°C	(1) 500mL plastic	

OBSERVATIONS / NOTES:

11.02
1.23
9.79

9.79

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: CNC 25
Project No.:

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 25GLM0301
Sample Location: MW53
Sampled By: R.T
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 9-12-99	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Time: 1510	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	%	NA
Method: Slow Purge	See	Below						

PURGE DATA:

Date: 9-1299	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Slow Purge	Initial	4.87	1.22	29.3	377	1.76		
Monitor Reading (ppm):	1	5.38	1.06	29.7	60	1.69		
Well Casing Diameter & Material	2	5.20	1.14	29.5	28	1.88		
Type:	3	5.08	1.23	29.9	25	1.40		
Total Well Depth (TD): 12.35								
Static Water Level (WL): 5.90								
One Casing Volume(gal/L): 1.06								
Start Purge (hrs): 1146								
End Purge (hrs): ~~1146~~	1300							
Total Purge Time (min):								
Total Vol. Purged (gal/L): 4.00	gals							

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: CNC25
Project No.:

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 25GLM0401
Sample Location: MW-4
Sampled By: RN
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity %	Other NA
Date: 9-13-99								
Time: 1145								
Method: Grabbing	Clear	6.00	2.06	28.6	Ø	1.22		

PURGE DATA:

Date: 9-13-99	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Slow Purge	Initial	5.93	3.04	27.4	49	1.40		
Monitor Reading (ppm):	~~1~~	~~5.58~~	~~1.16~~	~~28.3~~	~~4~~	~~1.21~~	ORH	
Well Casing Diameter & Material	1	5.91	1.40	28.3	Ø	1.20		
Type: 2" PVC.	2	5.95	1.56	28.6	Ø	1.18		
Total Well Depth (TD): 12.16'	3	6.00	2.03	28.6	Ø	1.22		
Static Water Level (WL): 5.95								
One Casing Volume(gal/L): 1.0								
Start Purge (hrs): 0952								
End Purge (hrs): 1057								
Total Purge Time (min):								
Total Vol. Purged (gal/L): 3.5								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
BTEX, MTBE, EDB, Naph	HCl	3X 40ml Vials	9-13-99
PAH's.	—	2X 1L amber	"

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD | Duplicate ID No.:

Signature(s):

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: Zone F
Project No.: 0019

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: ~~25GLM0707~~ 25GLM05-501
Sample Location: CNC25MW35
Sampled By: JA/JE
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 9-21-99	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Time: 1705	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	%	NA
Method: Peristaltic	clear	5.33	0.269	29.7	0	5.45	—	—

PURGE DATA:

Date: 9-21-99	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Peristaltic	Initial	5.11	0.194	29.9	0	0.57		
Monitor Reading (ppm): —	1	5.11	0.198	30.3	0	1.07		
Well Casing Diameter & Material	2	5.31	0.248	29.8	0	0.86		
Type: 4" PVC	3	5.29	0.272	28.8	0	2.22		
Total Well Depth (TD): 12.85	3.5 JE	5.33	0.269	29.7	0	3.45		
Static Water Level (WL): 4.54								
One Casing Volume(gal/L): 4.9 gal								
Start Purge (hrs): 1522								
End Purge (hrs): 1716								
Total Purge Time (min): 114 min								
Total Vol. Purged (gal/L): 18 gal								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL Volatiles	HCl/4°C	(3) 40 mL Vials	yes
Dissolved Methane	HCl/4°C	(3) 40 mL Vials	
Lead	HNO_3/4°C	(1) 250mL ~~Pl~~ plastic	
PAHs	4°C	(2) 1 L Amber	
Anions	4°C	(1) 500 mL ~~Pl~~ plastic	

OBSERVATIONS / NOTES:

product sheen on the surface of the purge water bucket

Circle if Applicable:

MS/MSD

Duplicate ID No.: ~~25GA~~ 25GLM05010

Signature(s):

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: GNC25
Project No.:

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 25GM0601
Sample Location: MW-6
Sampled By: BN
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity %	Other NA
Date: 9-12-99								
Time: 1630								
Method: Grabbing	See Below							

PURGE DATA:

Date: 9-12-99	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Slow Purge	Initial	6.75	1.39	26.6	17	4.35		
Monitor Reading (ppm):	1	6.36	6.89	25.9	12	1.46		
Well Casing Diameter & Material	2	6.33	5.44	25.5	37	1.52		
Type: 2" PVC	3	6.47	5.72	25.7		1.67		
Total Well Depth (TD): 26.15								
Static Water Level (WL): 6.00'								
One Casing Volume(gal/L): 3.3 gal								
Start Purge (hrs): 1140								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: CNC 25
Project No.:

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 25GWM0701
Sample Location: MW-7
Sampled By: RN
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity %	Other NA
Date: 9-13-99								
Time: 1115								
Method: Geopump	Clear	5.56	1.18	28.6	Ø	1.10		

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 9-13-99								
Method: Slow Purge	Initial	5.56	2.56	27.2	418	1.16		
Monitor Reading (ppm):	1	5.58	1.16	28.3	4	1.21		
Well Casing Diameter & Material	2	5.57	1.27	28.5	2	1.07		
Type: 2" PVC.	3	5.56	1.18	28.6	2	1.11		
Total Well Depth (TD): 12.30								
Static Water Level (WL): 6.50								
One Casing Volume(gal/L): .98								
Start Purge (hrs): 0949								
End Purge (hrs): 1048								
Total Purge Time (min):								
Total Vol. Purged (gal/L): 3 gal.								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
BTEX, MTBE, EDB, Naph	HCl	3 x 40 ml vials	9-13-99
Dissolved Methane	HCl	" " "	"
PAH	—	2 x 1 L amber	"
Anions	—	1 x 500 ml plastic.	"
Total Pb	HNO3	1 - 250 ml "	"

Resampled 9/21/99

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: Zone F
Project No.: 0214

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 25GLM0701
Sample Location: CNC 25 MW7
Sampled By: JA/JE
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 9-21-99	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Time: —	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	%	NA
Method: Peristaltic	clear	5.33	0.686	29.2	0	5.88	—	—

PURGE DATA:

Date: 9-21-99	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Peristaltic	Initial	5.62	2.50	28.4	95	5.03		
Monitor Reading (ppm): —	1	5.33	0.774	29.2	0	4.08		
Well Casing Diameter & Material	2	5.31	0.735	29.2	0	4.62		
Type: 2" PVC	3	5.33	0.686	29.2	0	5.88		
Total Well Depth (TD): 12.36								
Static Water Level (WL): 6.44								
One Casing Volume(gal/L): 1 gal								
Start Purge (hrs): 1513								
End Purge (hrs): 1540								
Total Purge Time (min): 27 min								
Total Vol. Purged (gal/L): ~4 gal								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL Volatiles	HCl/4°C	(3) 40 ml vials	yes
Dissolved methane	HCl/4°C	(3) 40 mL vials	
Lead	HNO_3/4°C	(1) 250 mL ~~glass~~ plastic	
PAHs	4°C	(2) 1L Amber	
Anions	4°C	(1) 500 mL plastic	

OBSERVATIONS / NOTES:

Sample Bottles were already taken in the previous session

Circle if Applicable:		Signature(s):
MS/MSD	Duplicate ID No.:	[signature]

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: CNG25
Project No.:

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 25GLM0801
Sample Location: MW-8
Sampled By: R.H
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity %	Other NA
Date: 9-12-99								
Time: 1155								
Method: Geopump	See	Below						

PURGE DATA:

Date: 9-12-99	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Slow Purge	Initial	5.28	2.54	28.6	441	1.59		
Monitor Reading (ppm):	.1	~~5.38~~	~~1.06~~	~~29.2~~	~~60~~	~~1.64~~	50%	
Well Casing Diameter & Material	1	5.59	2.18	28.7	38	1.59		
Type: 2" PVC.	2	5.41	2.32	28.5	35	1.54		
Total Well Depth (TD): 12.20	3	5.36	2.40	28.7	35	1.53		
Static Water Level (WL): 3.85								
One Casing Volume(gal/L): 1.38								
Start Purge (hrs): 1212								
End Purge (hrs): 1317								
Total Purge Time (min):								
Total Vol. Purged (gal/L): 4.00	gals.							

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
BTEX, MTBE, EDB, Naph	HCl	3 X 40 ml vials	9-12-99
PAH		2 X 1L amber	"
Total Lead	HNO3	1 X 250 ml plastic	"

OBSERVATIONS / NOTES:

Circle If Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: Zone F
Project No.: 0219

Sample ID No.: 25GLX0201
Sample Location: ~~CNC25 X02~~ 609002
Sampled By: JA / JE / TC
C.O.C. No.:

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 9-21-99	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Time: 1615	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	%	NA
Method: Peristaltic	clear orange	6.70	4.09	20.0	3	0.11	—	—

PURGE DATA:

Date: 9-21-99	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Peristaltic	Initial	6.43	2.98	26.3	18	0.78	0.14	—
Monitor Reading (ppm): —	1	6.51	2.27	27.3	6	0.30	0.10	—
Well Casing Diameter & Material	2	6.64	3.59	26.5	71	0.45	0.18	turned pump down b/c it was drawin down
Type: 2" PVC	3 JE	stop pump at 1200						
Total Well Depth (TD): 11.59	----	restart at 1313						
Static Water Level (WL): ~~5.46~~ 3.65								
One Casing Volume(gal/L): 1.3 gal	3	6.83	3.69	26.4	137	6.23	stop pump at 1334	
Start Purge (hrs): 1040	4	6.70	4.09	26.0	3	0.11	—	
End Purge (hrs): 1609								
Total Purge Time (min): ~ 2 hrs								
Total Vol. Purged (gal/L): ~4 gal								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL Volatiles	HCl/4°C	(3) 40 ml vials	yes
PAHs	4°C	(2) 1 L Amber	yes
Lead	HNO_3/4°C	(1) 250 mL plastic	yes
~~NA Parameters~~			
~~TCL Volatiles~~			
~~Lead~~ JE			

OBSERVATIONS / NOTES:

Well continued to run dry after stopping & restarting the pump 4 times -- we sampled

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): [signature]

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: Zone F
Project No.: 0219

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 25GLX0401 ~~25 01~~
Sample Location: ~~GLC25X09~~ G09004
Sampled By: JA / JE
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 9-21-99	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Time: 1210	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	%	NA
Method: Peristaltic	slightly cloudy	6.45	0.98	26.6	75	1.77	0.04	—

PURGE DATA:

Date: 9-21-99	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Peristaltic	Initial	6.54	0.91	26.8	0	1.60	0.02	—
Monitor Reading (ppm): —	1	6.49	1.02	26.9	0	0.29	0.04	—
Well Casing Diameter & Material	2	6.48	0.98	26.5	243	1.54	0.04	turned pump down b/c it was drawing down
Type: 2" PVC	3	6.45	0.98	26.6	75	1.77	0.04	
Total Well Depth (TD): 13.07								
Static Water Level (WL): 4.62								
One Casing Volume(gal/L): 5.2L/1.2Gal								
Start Purge (hrs): 1040								
End Purge (hrs): 1200								
Total Purge Time (min): 80min								
Total Vol. Purged (gal/L): ~5gal								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL Volatiles	HCl\4°C	(3) 40mL vials	yes
PAHs	4°C	(2) 1 L Amber	yes
Lead	HNO_3\4°C	(1) 250mL Plastic	yes
~~NA Parameters~~			
~~TCL Volatiles~~ JE	~~HCl/4°C~~	~~(3) 40mL vials~~	~~yes~~
~~Lead~~	~~HNO_3/4°C~~	~~(1) 250mL Plastic~~	~~yes~~
~~Anions~~	~~4°C~~	~~(1) mL Plastic~~	~~yes~~

OBSERVATIONS / NOTES:

Circle If Applicable:

MS/MSD	Duplicate ID No.:	Signature(s):

APPENDIX B

ANALYTICAL LABORATORY DATA
SOIL AND GROUNDWATER

Katahdin
ANALYTICAL SERVICES

Site 25
GW

October 13, 1999

MW-03
-04
-06
-07
-08

Mr. Paul Calligan
Tetra Tech Nus
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

RE: Katahdin Lab Number:	WP3906
Project ID:	CNC Charleston
Project Manager:	Ms. Andrea J.Colby
Sample Receipt Date(s):	9/14/99

Dear Mr. Calligan:

Please find enclosed the following information:

* Report of Analysis
* Quality Control Data Summary
* Chain of Custody
* Confirmation

Should you have any questions or comments concerning this Report of Analysis, please do not hesitate to contact the project manager listed above. This cover letter is an integral part of the ROA.

We appreciate your continued use of our laboratory and look forward to working with you in the future. The following signature indicates technical review and acceptance of the data.

Sincerely,

KATAHDIN ANALYTICAL SERVICES

Patricia Gomez
Authorized Signature

10/13/99
Date

SDG NARRATIVE
KATAHDIN ANALYTICAL SERVICES
TETRA TECH NUS
CASE CNC CHARLESTON

Sample Receipt

The following samples were received on September 14, 1999 and were logged in under Katahdin Analytical Services work order number WP3906 for a hardcopy due date of October 14, 1999.

KATAHDIN Sample No.	TTNUS Sample Identification
WP3906-1	36GLM0101
WP3906-2	36GLO680004
WP3906-3	36GLM0701
WP3906-4	36GLM0401
WP3906-5	36GLM0501
WP3906-6	42GLM0401
WP3906-7	42GLM0301
WP3906-8	42GLM0201
WP3906-9	42GLM0501
WP3906-10	42GLM1401
WP3906-11	42GLM1701
WP3906-12	42GLM1501
WP3906-13	42GLM1601
WP3906-14	36GLM0201D
WP3906-15	22GLM0101
WP3906-16	22GLM0201
WP3906-17	22GLM0501
WP3906-18	22GLM0701
WP3906-19	42GLM1001
WP3906-20	42GLM1201
WP3906-21	42GLM0801
WP3906-22	42GLM0601
WP3906-23	42GLM0701D
WP3906-24	42GLM0101D
WP3906-25	42GLM1801
WP3906-26	42TL00101
WP3906-27	23TL00201
WP3906-28	36GLM0601
WP3906-29	36GLM0201
WP3906-30	36GLM0301
WP3906-31	42GLM0701
WP3906-32	42GLM0901
WP3906-33	42GLM1101
WP3906-34	42GLM0101

WP3906-35	42GLM1301
WP3906-36	23GLM0401
WP3906-37	23GLX0301
WP3906-38	23GLX0401
WP3906-39	23GLX0401D
WP3906-40	23GLM05D01
WP3906-41	23GLM0101
WP3906-42	25GLM0301
WP3906-43	25GLM0801
WP3906-44	25GLM0601
WP3906-45	25GLM0401
WP3906-46	25GLM0701
WP3906-47	16GLM7D01
WP3906-48	26GLP1201
WP3906-49	26GLP1301

The samples were logged in for the analyses specified on the chain of custody form. All problems encountered and resolved during sample receipt have been documented on the applicable chain of custody forms.

Sample analyses have been performed by the methods as noted herein.

Volatile Organic Analysis

Forty-seven aqueous samples were received by the Katahdin Analytical Services, Inc. GC/MS laboratory on September 14, 1999 and were specified to be analyzed by USEPA method 8260B for the analytes benzene, toluene, ethylbenzene, xylenes, MTBE, naphthalene, and EDB.

Analyses for this workorder were performed on the 5973-U and 5970-Q instruments. A VSTD050 (50 ppb standard) was used for the continuing calibration standard. Internal standard and surrogate compounds were also spiked at 50 ppb.

Batch QC (VBLK, and LCS) was performed in each twelve-hour window. Results are included in this data package. The LCS QC samples were spiked with the entire list of compounds quantitated for at 50 ppb. Matrix spike/matrix spike duplicate analyses were performed on samples WP3906-5, -17, and -19.

Analyses of samples WP3906-10, -11, and -13 yielded concentrations of 1,2-dichloroethene (cis) over the upper limit of the calibration curve. Since this was not a requested analyte to be reported by the client, no laboratory action was taken.

Analysis of sample WP3906-19 was performed at a 1:5 dilution due to naphthalene concentrations, resulting in elevated reporting limits.

The initial analysis of sample WP3906-30 was performed outside of the twelve hour BFB tuning window. This was recognized during data review, and the subsequent reanalysis was outside of analytical holding times. Only the reanalysis performed outside of holding times is included in this data package.

Initial analyses of samples WP3906-36 and -44 yielded concentrations of target analytes over the upper limit of the calibration curve. Reanalyses occurred at 1:50 and 1:5 dilutions, respectively. Both sets of data for each sample are included in the data package.

Analysis of the QC samples WP3906-19MS/MSD yielded target analyte concentrations over the upper limit of the calibration curve. In accordance with the method, no laboratory action was taken with these samples.

Several manual integrations were performed due to split peaks; all have been flagged with a "M" (software-generated) on the pertinent quantitation reports. All "M" flags have been dated and initialed by the analyst performing the integration. In addition, all "M" flags have been reviewed and approved by the GC/MS supervisor. Copies of each manual integration are included in the pertinent quantitation reports.

No other protocol deviations were noted by the volatile organics staff.

Semivolatile Organic Analysis

Twenty-three aqueous samples were received by Katahdin Analytical Services laboratory on September 14, 1999 for analysis in accordance with 8270C for a client specified PAH list of analytes.

Extraction of samples WP3906 3-12 and 15-18 occurred following USEPA method 3510 on September 16, 1999. A laboratory control spike/laboratory control spike duplicate pair was extracted in the batch. Samples WP3906-13 and -19-25 were extracted following USEPA method 3510 on September 17, 1999. A laboratory control sample, along with a site-specific MS/MSD pair on sample WP3906-19, was extracted in this batch. The remaining sample, WP3906-14, was extracted following USEPA method 3510 on September 20, 1999. A laboratory control sample was also extracted in this batch.

Analysis of sample WP3906-19 yielded a concentration of the analyte naphthalene over the upper limit of the calibration curve. Reanalysis occurred at a 1:2 dilution successfully. Both sets of data for this sample are included in this data package.

Initial analysis of sample WP3906-22 yielded internal standard area recovery deviations. Reanalysis yielded similar results, confirming matrix interference. Both sets of data are included in this data package.

Several manual integrations were performed due to split peaks; all have been flagged with a "M" by the data system. All manual integrations have been dated and initialed by the responsible analyst. Copies of each manual integration are included in the data package. All manual integrations have been reviewed and approved by the GC/MS supervisor.

No other protocol deviations were noted by the semivolatiles organics staff.

Metals Analysis

The samples of Katahdin Work Order WP3906 were prepared and analyzed for metals in accordance with the "Test Methods for Evaluating Solid Waste", SW-846, November 1986, Third Edition.

Inductively-Coupled Plasma (ICP) Atomic Emission Spectroscopic Analysis

Aqueous-matrix Katahdin Sample Nos. WP3906- (1-25, 28-46) were digested for ICP analysis on 09/17/99 (QC Batch PI17ICW0), 09/21/99 (QC Batch PI21ICW0), and 09/22/99 (QC Batch PI22ICW0) in accordance with USEPA Method 3010A. Katahdin Sample Nos. WP3906- (19, 46) were prepared with duplicate matrix-spiked aliquots during digestion.

ICP analyses of Katahdin Work Order WP3906 sample digestates were performed in accordance with USEPA Method 6010B, using a Thermo Jarrell Ash (TJA) Trace ICP spectrometer and a TJA 61 ICP spectrometer. All samples were analyzed within holding times and all QC criteria were met with the following comments or exceptions:

Some of the results for run QC samples (ICV, ICB, CCV, CCB, ICSA, and ICSAB) included in the accompanying data package may have exceeded acceptance limits for some elements. Please note that all client samples and batch QC samples associated with out-of-control results for run QC samples were subsequently reanalyzed for the analytes in question.

Analysis of Mercury by Cold Vapor Atomic Absorption (CVAA) Spectrophotometry

Aqueous-matrix Katahdin Sample Nos. WP3906- (1-25, 28-35) were digested for mercury analysis on 09/22/99 (QC Batch PI22HGW0), 09/25/99 (QC Batch PI25HGW0), and 09/27/99 (QC Batch PI27HGW0) in accordance with USEPA Method 7470A. Katahdin Sample No. WP3906-1 was prepared with a single matrix-spiked aliquot, and Katahdin Sample Nos. WP3906- (19, 21) were prepared with duplicate matrix-spiked aliquots during digestion.

Mercury analyses of Katahdin Work Order WP3906 sample digestates were performed using a Leeman Labs PS200 automated mercury analyzer. All samples were analyzed within holding times and all run QC criteria were met.

Wet Chemistry Analysis

Due to IC instrument failure, alternate methods were approved for work order WP3906 by Kelly Johnson-Carper for the analysis of nitrate and sulfate. Nitrate analyses (353.2) and Sulfate analyses (375.4) were performed according to the U.S. EPA, Methods for Analysis of Water and Wastes, EPA 600/4-79-020, 1979, Revised 1983. Nitrate analyses (E300) were performed according to the U.S. EPA "Methods for the Determination of Inorganic Substances in Environmental Samples", EPA 600/R-93/100, August 1993. All samples were analyzed within analytical hold times.

The Wet Chemistry staff noted no protocol deviations.

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) #: WD3906

PAGE: 1 OF 12

COOLER: 1 OF 12

COC#: –
SDG#: –
DATE / TIME RECEIVED: 09-14-99 ~0900
DELIVERED BY: FEDEX
RECEIVED BY: BKR
LIMS ENTRY BY: BKR
LIMS REVIEW BY / PM: ADC

CLIENT: Tetratech NUS

PROJECT: CNC CHARLESTON

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☑	☐	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☑	☐	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 2.1	
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT Y or N?	☑	☐	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☑	☐	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	☐	☑	☐		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP NFESC ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]: HNO_3 added to metals aliquot to bring pH <2 : 426LM1001, 366LM0301, 426LM0701, 426LM0901, 426LM1101, 366LM0601, 366LM0201, 366LM0701, 366LM0401, 366LM0101, 366L0680004, 426LM0701D

(1) Use thi[s] [spac]e (and additional sheets if necessary) to document samples that are received bro[ken o]r compromised, C-O-C discrepancies, radiation checks, residual chlorine check, res[ults] of pH check if [re]quired. If samples required pH adjustment, record volume and type of preservative added.

0000219

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) #: WD3906
PAGE: 2 OF 12
COOLER: 2 OF 12
COC#: –
SDG#: –
DATE / TIME RECEIVED: 09-14-99 ~0900
DELIVERED BY: FED EX
RECEIVED BY: BKR
LIMS ENTRY BY: BKR
LIMS REVIEW BY / PM: AJC

CLIENT: Tetratech NUS

PROJECT: CNC CHARLESTON

Vm

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☑	☐	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☐	☑	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 1.3	AJC notified Jeff Alexander 9/14/99
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT Y or N?	~~☐~~ BKR	☑	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☐	☑	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	~~☐~~ BKR	☑	☐		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP NFESC ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]:
* Sample matching discussed w/ P.M
No containers for 226LM02010 – Jeff Alexander said to cross off COC
Received Pb bottle for 256LM0401 – Jeff Alexander said to add to COC

[1] Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative added.

0000220

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) #: WD3906
PAGE: 3 OF 12
COOLER: 3 OF 12
COC#: —
SDG#: —
DATE / TIME RECEIVED: 09-14-99~0900
DELIVERED BY: FEDEX
RECEIVED BY: BKR
LIMS ENTRY BY: BKR
LIMS REVIEW BY / PM: AJC

CLIENT: Tetratech NUS

PROJECT: CNC CHARLESTON

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☐	☑	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☐	☐	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 2.6	
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT Y or N?	☑	☐	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☐	☑	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	~~☑~~ BR	☑	☐		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP NFESC ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]:

(1) Use this space (and additional sheets if necessary) to document samples that are received brok[illegible] or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, r[illegible] of pH check [illegible]ired. If samples required pH adjustment, record volume and type of preservative a[illegible].

0000221

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) #: WD3906
PAGE: 4 OF 12
COOLER: 4 OF 12
COC#: –
SDG#:
DATE / TIME RECEIVED: 09-14-99 ~0900
DELIVERED BY: FED EX
RECEIVED BY: BKR
LIMS ENTRY BY: BKR
LIMS REVIEW BY / PM: AJC

CLIENT: Tetratech NUS

PROJECT: CNC CHARLESTON

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☐	☑	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☐	☑	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 2.0	
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT Y or N?	☑	☐	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☑	☐	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	☐	☑	☐		
12. CORRECTIVE ACTION REPORT FILED?	☒	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP NFESC ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]:

[1] Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative added.

0000222

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) #: WP3906
PAGE: 5 OF 12
COOLER: 5 OF 12
COC#: —
SDG#: —
DATE / TIME RECEIVED: 09-14-99 ~0900
DELIVERED BY: FEDEX
RECEIVED BY: BKR
LIMS ENTRY BY: BKR
LIMS REVIEW BY / PM: AJL

CLIENT: Tetratech NUS

PROJECT: CNC CHARLESTON

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☐	☑	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☐	☑	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 3.2	
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT Y or N?	☑	☐	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☐	☑	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	☐	☑	☐		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP NFESC ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]:

0000223

(1) Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative added.

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
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LAB (WORK ORDER) #: WD3906
PAGE: 6 OF 12
COOLER: 6 OF 12
COC#: —
SDG#: —
DATE / TIME RECEIVED: 09-14-99 ~0900
DELIVERED BY: FEDEX
RECEIVED BY: BKR
LIMS ENTRY BY: BEK
LIMS REVIEW BY / PM: AJC

CLIENT: Tetratech NUS

PROJECT: CNC CHARLESTON

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☐	☑	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☐	☑	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 3.1	
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE ICE PACKS PRESENT Y or N?	☑	☐	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☐	☑	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED(1)?	☐	☑	☐		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP NFESC ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES(1):

(1) Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative added.

0000224

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) #: WD3906

PAGE: 7 OF 12

COOLER: 7 OF 12

COC#: —
SDG#: —
DATE / TIME RECEIVED: 09-14-99 ~0900
DELIVERED BY: FEDEX
RECEIVED BY: BKR
LIMS ENTRY BY: BKR
LIMS REVIEW BY / PM: AJC

CLIENT: Tetratech NUS

PROJECT: CNC CHARLESTON

Vm

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☐	☑	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☐	☑	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 3.0	
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT Y or N?	☑	☐	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☐	☑	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	☐	☑	☐		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP NFESC ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]:

[1] Use thi[...]nce (and additional sheets if necessary) to document samples that are received br[...] or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, re[...]ts of pH check [...]uired. If samples required pH adjustment, record volume and type of preservative added.

0000225

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) #: WD3906

PAGE: 8 OF 12

COOLER: 8 OF 12

COC#: —
SDG#: —
DATE / TIME RECEIVED: 09-14-99 ~0900
DELIVERED BY: FEDEX
RECEIVED BY: BKK
LIMS ENTRY BY: BKK
LIMS REVIEW BY / PM: AJC

CLIENT: Tetratech NUS

PROJECT: CNC CHARLESTON

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☐	☑	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☐	☑	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 2.2	
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT Y or N?	☑	☐	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☐	☑	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	☐	☑	☐		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP NFESC ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]:

(1) Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative added.

0000226

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) #: WD3906
PAGE: 9 OF 12
COOLER: 9 OF 12
COC#: —
SDG#: —
DATE / TIME RECEIVED: 09-14-99~0900
DELIVERED BY: FEDEX
RECEIVED BY: BKR
LIMS ENTRY BY: BKR
LIMS REVIEW BY / PM: ABC

CLIENT: Tetratech NUS

PROJECT: CNC CHARLESTON

Vm

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☐	☑	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☐	☑	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 2.1	
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT Y or N?	☑	☐	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☐	☑	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	☐	☑	☐		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP NFESC ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]:

(1) Use this [space] (and additional sheets if necessary) to document samples that are received bro[ken o]r compromised, C-O-C discrepancies, radiation checks, residual chlorine check, res[ults] of pH check if [req]uired. If samples required pH adjustment, record volume and type of preservative added.

0000227

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) # WD3906

PAGE: 10 OF 12

COOLER: 10 OF 12

CLIENT: Tetratech NUS

COC#

SDG#

DATE / TIME RECEIVED: 09-14-99 ~0900

DELIVERED BY: FEDEX

RECEIVED BY: BKK

LIMS ENTRY BY: BKW

LIMS REVIEW BY / PM: AJL

PROJECT: CNC CHARLESTON

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☐	☑	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☐	☑	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 2.1	
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT Y or N?	☑	☐	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☐	☑	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	☐	☑	☐		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP NFESC ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]:

0000228

[1] Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative added.

KATAHDIN ANALYTICAL SERVICES, INC.
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LAB (WORK ORDER) #: WD3906
PAGE: 11 OF 12
COOLER: 11 OF 12
COC#:
SDG#:
DATE / TIME RECEIVED: 09-14-99~0900
DELIVERED BY: FEDEX
RECEIVED BY: BKR
LIMS ENTRY BY: BKU
LIMS REVIEW BY / PM: AJC

CLIENT: Tetratech NUS

PROJECT: CNC CHARLESTON

Vm

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☐	☑	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☐	☑	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 1.7	AJC notified Jeff Alexander 9/14/99
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT Y or N?	~~☑~~ BK	☑	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☐	☑	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	☐	☑	☐		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP NFESC ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]:

(1) Use this [illegible]e (and additional sheets if necessary) to document samples that are received bro[illegible] [illegible]r compromised, C-O-C discrepancies, radiation checks, residual chlorine check, res[illegible] of pH check if re[illegible]uired. If samples required pH adjustment, record volume and type of preservative added.

0000229

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) # WD3906

PAGE: 12 OF 12

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COC# —
SDG# —
DATE / TIME RECEIVED: 09-14-99 ~0900
DELIVERED BY: FED EX
RECEIVED BY: BKR
LIMS ENTRY BY: BKR
LIMS REVIEW BY / PM: AJC

CLIENT: Tetratech NUS

PROJECT: CNC CHARLESTON

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☐	☑	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☐	☑	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 3.1	
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT Y or N?	☑	☐	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☐	☑	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	☐	☑	☐		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP NFESC ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]:

0000230

(1) Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative added.

Katahdin Analytical Services
340 County Road No. 5
P.O. Box 720
Westbrook, ME 04098
Tel: (207) 874-2400
Fax: (207) 775-4029

CHAIN of CUSTODY

PLEASE PRINT IN PEN

Client: Tetra Tech NUS Inc
Contact: Paul Calligan
Phone #: (843) 554-4425
Fax #: ( )

Address: NH 21 AVE H
City: N. Charleston
State: SC
Zip Code:

Purchase Order #:
Proj. Name / No.:
Katahdin Quote #:

Bill (if different than above):
Address:

Sampler (Print / Sign): Jerry Krieger / Jerry Krieger
Copies To:

LAB USE ONLY
WORK ORDER #: WP3906 -
KATAHDIN PROJECT MANAGER: ____

REMARKS: ____

SHIPPING INFO: ☐ FED EX ☐ UPS ☐ CLIENT
AIRBILL NO: ____
TEMP°C ____ ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

ANALYSIS AND CONTAINER TYPE PRESERVATIVES

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	BTEX, MTBE, EDB NAPH	PAH	Total Lead	Anions Nitrate, Sulfate	Dissolved Methane					
					Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N	Filt. ☐Y☐N
	23GLM0401	9/10/99 / 1517	GW	6	3	2	1							
	23GLX0301	9/10/99 / 1535	GW	6	3	2	1							
	23GLX0401	9/10/99 / 1540	GW	6	3	2	1							
	23GLX0401D	9/10/99 / 0000	GW	6	3	2	1							
	23GLM05D01	9/10/99 / 1600	GW	6	3	2	1							
	23GLM0101	9/10/99 / 1630	GW	6	3	2	1							
	23TL00201	9/10/99 / 0800	GW	1	1									
	16GLM7D01	9/12/99 / 0755	GW	5	3	2								
	25GLM0301	/ 1510	GW	6	3	2	1							
	25GLM0801	/ 1555	GW	6	3	2	1							
	25GLM0601	/ 1620	GW	6	3	2	1							
	25GLM0701	9/13/99 / 1115	GW	10	3	2	1	1	3					
	25GLM0401	/ 1140	GW	5	3	2	1							
	26GLP1201	/ 1345	GW	5	3	2								
	26GLP1301	/ 1355	GW	5	3	2								
		/												

Cooler 2 of 2
BRS

COMMENTS

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
J. Krieger	9/13/99 1900	Fedex		9-14-99 0900	[signature]
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

Katahdin Analytical Services
340 County Road No. 5
P.O. Box 720
Westbrook, ME 04098
Tel: (207) 874-2400
Fax: (207) 775-4029

CHAIN of CUSTODY

PLEASE PRINT IN PEN

Client	Contact	Phone #	Fax #
TETRA TECH NUS	PAUL CALLIGAN	(850) 385-9899	(850) 350-986

Address	City	State	Zip Code
1401 OVEN PARK DR 102	TALLAHASSEE	FL	32308

Purchase Order #   Proj. Name / No.   Katahdin Quote #

Bill (if different than above)   Address

Sampler (Print / Sign) T. Thompson Thomas Thompson   Copies To:

LAB USE ONLY   WORK ORDER #: WP3906

KATAHDIN PROJECT MANAGER

REMARKS:

SHIPPING INFO: ☐ FED EX ☐ UPS ☐ CLIENT

AIRBILL NO:

TEMP°C ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

ANALYSIS AND CONTAINER TYPE PRESERVATIVES

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	BTEX, MTBE, EDB, TOTAL NAPH. (HCl)	PAH (None)	Metals (HNO3)	Dissolved Methane (HCl)	Anions (None)					
	36GLM0601	91399/1015	GW	10	3	2	1	3	1					
	36GLM0201	91399/1055	GW	10	3	2	1	3	1					
	36GLM0301	91399/1131	GW	10	3	2	1	3	1					
	36GLM0201D	91399/0000	GW	6	3	2	1							
	22GLM0101	91099/1130	GW	6	3	2	1							
	22GLM0201	91099/1110	GW	6	3	2	1							
	22GLM0501	91099/1418	GW	6	3	2	1							
	22GLM0701	91099/1420	GW	6	3	2	1							
	~~22GLM0201D~~	~~91099/0000~~	~~GW~~	~~6~~	~~3~~	~~2~~	~~1~~	BR						
		/												
		/												
		/												
		/												
		/												
		/												
		/												

Cooler 1 of 1 BR
(All Three C.O.C

COMMENTS

Placed on ice.

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
[signature]	9/13/99 1700	81345836933 0		9-14-99 0900	[signature]
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

Katahdin Analytical Services
340 County Road No. 5
P.O. Box 720
Westbrook, ME 04098
Tel: (207) 874-2400
Fax: (207) 775-4029

CHAIN OF CUSTODY

PLEASE PRINT IN PEN

Client: Tetra Tech NUS
Contact: Paul Calligan
Phone #: (850) 385-9899
Fax #: (850)

Address: 1401 Oven Park Dr 102
City: Tallahassee
State: FL
Zip Code: 3230

Purchase Order #:
Proj. Name / No.:
Katahdin Quote #:

Bill (if different than above):
Address:

Sampler (Print / Sign): P. Halverson
Copies To:

LAB USE ONLY
WORK ORDER #: WP 3906
KATAHDIN PROJECT MANAGER:

REMARKS:

SHIPPING INFO: ☐ FED EX ☐ UPS ☐ CLIENT
AIRBILL NO:
TEMP°C: ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

ANALYSIS AND CONTAINER TYPE PRESERVATIVES

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	Metals (HNO3)	BTEX, EDB, MTBE, Total Naph. (HCl)	PAH (None)	Dissolved Methane (HCl)	Anions (None)					
	42GLM1001	91299/0941	GW	6	1	3	2							
	42GLM0701	91299/1000	GW	9	1	3	2	3						
	42GLM1201	91299/~~1000~~ 1030	GW	6	1	3	2							
	42GLM0901	91299/1030	GW	~~6~~ 9	1	3	2	3						
	42GLM0801	91299/1057	GW	6	1	3	2							
	42GLM1101	91299/1106	GW	9	1	3	2	3						
	42GLM0101	91299/1435	GW	10	1	3	2	3	1					
	42GLM1301	91299/1449	GW	10	1	3	2	3	1					
	42GLM0601	91299/1535	GW	6	1	3	2							
	42GLM0701	91299/1202	GW	1					1					
	42GLM0901	91299/1206	GW	1					1					
	42GLM1101	91299/1204	GW	1					1					
	42GLM0701D	91299/0000	GW	6	1	3	2							
	42GLM0101D	91299/0000	GW	6	1	3	2							
	42GLM1001M	91299/0941	GW	6	1	3	2							
	42GLM1801	91399/0842	GW	6	1	3	2							

COMMENTS

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
[signature]	9/13/99 1700	8134583693330		9-14-99 0900	[signature]
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

Katahdin Analytical Services
P.O. Box 720
Westbrook, ME 04098
Tel: (207) 874-2400
Fax: (207) 775-4029

CHAIN of CUSTODY

PLEASE PRINT IN PEN

Client: TETRA TECH NUS
Contact: PAUL CALLIGAN
Phone #: (850) 385-9899
Fax #: (850)
Address: 1401 OVEN PARK DR. 102
City: TALLAHASSEE
State: FL.
Zip Code: 32308
Purchase Order #
Proj. Name / No.
Katahdin Quote #
Bill (if different than above)
Address
Sampler (Print / Sign): P. HALVERSON
Copies To:

LAB USE ONLY
WORK ORDER #: WP3906
KATAHDIN PROJECT MANAGER
REMARKS:
SHIPPING INFO: ☒ FED EX ☐ UPS ☐ CLIENT
AIRBILL NO:
TEMP°C ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

ANALYSIS AND CONTAINER TYPE PRESERVATIVES

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	METALS HNO3 (Filt. ☐Y ☒N)	BTEX/MTBE/EDB TOTAL NAPH. HCl (Filt. ☐Y ☒N)	PAH (Filt. ☐Y ☒N)	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N
	36GLM0101	91099/1110	GW	1	1									
	36GL0680004	91099/1115	GW	1	1									
	36GLM0701	91099/1120	GW	6	1	3	2							
	36GLM0401	91099/1510	GW	6	1	3	2							
	36GLM0501	91099/1515	GW	6	1	3	2							
	~~3~~42GLM0401	91199/1055	GW	6	1	3	2							
	42GLM0301	91199/1050	GW	6	1	3	2							
	42GLM0201	91199/1045	GW	6	1	3	2							
	42GLM0501	91199/1035	GW	6	1	3	2							
✓	42GLM1401	91199/1125	GW	6	1	3	2							
✓	42GLM1701	91199/1110	GW	6	1	3	2							
✓	42GLM1501	91199/1110	GW	6	1	3	2							
✓	42GLM1601	91199/1125	GW	6	1	3	2							
	42TLØØ1Ø1	9/13/99	aq	2		2								
		/												
		/												

COMMENTS

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
[signature]	9/13/99 1700	8134583693330		9-14-99 0900	[signature]
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

ORIGINAL 0000234

ORDER NO WP-3906

Project Manager: Andrea J. Colby
ORDER DATE: 09/14/99
PHONE: 850/385-[illegible]99
FAX: 850/385-[illegible]0
DUE: 14 OCT
FAC.ID: CNC CHARLESTON

REPORT TO: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
FOSTER PLAZA 7, 661 ANDERSEN DR.
PITTSBURGH, PA 15220

PHONE: 412/921-7090
PO: N7912-P99264
PROJECT: CTO #68

SAMPLED BY: P.HALVERSON/T.THOMPSON/J.KRIEGERDELIVERED BY: FEDEXDISPOSE: AFTER 13

ITEM	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
1	WP3906-1	36GLM0101	10 SEP 1110	14 SEP	AQ
	WP3906-2	36GLO680004	10 SEP 1115		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Target Analyte List Metals, Total		2	100.00	200.00

LABORATORY ORDER CONTINUED ON PAGE 2

ORDER NO WP-3906

Project Manager: Andrea J. Colby
ORDER DATE: 09/14/99
PHONE: 850/385-9899
FAX: 850/385-9860
DUE: 14 OCT
FAC.ID: CNC CHARLESTON

REPORT TO: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
FOSTER PLAZA 7, 661 ANDERSEN DR.
PITTSBURGH, PA 15220

PHONE: 412/921-7090
PO: N7912-P99264
PROJECT: CTO #68

SAMPLED BY: P.HALVERSON/T.THOMPSON/J.KRIEGERDELIVERED BY: FEDEXDISPOSE: AFTER 13

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
2	WP3906-3	36GLM0701	10 SEP 1120	14 SEP	AQ
	WP3906-4	36GLM0401	10 SEP 1510		
	WP3906-5	36GLM0501	10 SEP 1515		
	WP3906-6	42GLM0401	11 SEP 1055		
	WP3906-7	42GLM0301	11 SEP 1050		
	WP3906-8	42GLM0201	11 SEP 1045		
	WP3906-9	42GLM0501	11 SEP 1035		
	WP3906-10	42GLM1401	11 SEP 1125		
	WP3906-11	42GLM1701	11 SEP 1110		
	WP3906-12	42GLM1501	11 SEP 1110		
	WP3906-13	42GLM1601	11 SEP 1125		
	WP3906-14	36GLM0201D	13 SEP		
	WP3906-15	22GLM0101	10 SEP 1130		
	WP3906-16	22GLM0201	10 SEP 1110		
	WP3906-17	22GLM0501	10 SEP 1418		
	WP3906-18	22GLM0701	10 SEP 1420		
	WP3906-19	42GLM1001	12 SEP 0941		
	WP3906-20	42GLM1201	12 SEP 1030		
	WP3906-21	42GLM0801	12 SEP 1057		
	WP3906-22	42GLM0601	12 SEP 1535		
	WP3906-23	42GLM0701D	12 SEP 0000		
	WP3906-24	42GLM0101D	12 SEP 0000		
	WP3906-25	42GLM1801	13 SEP 0842		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Target Analyte List Metals, Total		23	100.00	2300.00
Volatile Organics by 8260B	SW8260	23	75.00	1725.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	23	125.00	2875.00
TOTALS		23	300.00	6900.00

LABORATORY ORDER CONTINUED ON PAGE 3

KT 6/14/99

ORDER NO WP-3906

Project Manager: Andrea J. Colby
ORDER DATE: 09/14/99
PHONE: 850/385-^899
FAX: 850/385- 60
DUE: 14 OCT
FAC.ID: CNC CHARLESTON

REPORT TO: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
FOSTER PLAZA 7, 661 ANDERSEN DR.
PITTSBURGH, PA 15220

PHONE: 412/921-7090
PO: N7912-P99264

PROJECT: CTO #68

SAMPLED BY: P.HALVERSON/T.THOMPSON/J.KRIEGERDELIVERED BY: FEDEXDISPOSE: AFTER 13

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
3	WP3906-26	42TL00101	13 SEP	14 SEP	AQ
	WP3906-27	23TL00201	10 SEP 0800		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	2	75.00	150.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
4	WP3906-28	36GLM0601	13 SEP 1015	14 SEP	AQ
	WP3906-29	36GLM0201	13 SEP 1055		
	WP3906-30	36GLM0301	13 SEP 1131		
	WP3906-31	42GLM0701	12 SEP 1202		
	WP3906-32	42GLM0901	12 SEP 1206		
	WP3906-33	42GLM1101	12 SEP 1204		
	WP3906-34	42GLM0101	12 SEP 1435		
	WP3906-35	42GLM1301	12 SEP 1449		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Target Analyte List Metals, Total		8	100.00	800.00
Volatile Organics by 8260B	SW8260	8	75.00	600.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	8	125.00	1000.00
Nitrate as N	353.2	8	30.00	240.00
Sulfate	375.4	8	0.00	0.00
Methane Subcontract		8	95.00	760.00
TOTALS		8	425.00	3400.00

LABORATORY ORDER CONTINUED ON PAGE 4

ORDER NO WP-3906

Project Manager: Andrea J. Colby
ORDER DATE: 09/14/99
PHONE: 850/385-9899
FAX: 850/385-9860
DUE: 14 OCT
FAC.ID: CNC CHARLESTON

REPORT TO: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
FOSTER PLAZA 7, 661 ANDERSEN DR.
PITTSBURGH, PA 15220

PHONE: 412/921-7090
PO: N7912-P99264
PROJECT: CTO #68

SAMPLED BY: P.HALVERSON/T.THOMPSON/J.KRIEGERDELIVERED BY: FEDEXDISPOSE: AFTER 13

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
5	WP3906-36	23GLM0401	10 SEP 1517	14 SEP	AQ
	WP3906-37	23GLX0301	10 SEP 1535		
	WP3906-38	23GLX0401	10 SEP 1540		
	WP3906-39	23GLX0401D	10 SEP		
	WP3906-40	23GLM05D01	10 SEP 1600		
	WP3906-41	23GLM0101	10 SEP 1630		
	WP3906-42	25GLM0301	12 SEP 1510		
	WP3906-43	25GLM0801	12 SEP 1555		
	WP3906-44	25GLM0601	12 SEP 1620		
	WP3906-45	25GLM0401	13 SEP 1140		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	10	75.00	750.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	10	125.00	1250.00
Lead, Total	200.7/6010	10	20.00	200.00
Elements Sample Preparation		10	0.00	0.00
TOTALS		10	220.00	2200.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
6	WP3906-46	25GLM0701	13 SEP 1115	14 SEP	AQ

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	1	75.00	75.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	1	125.00	125.00
Lead, Total	200.7/6010	1	20.00	20.00
Elements Sample Preparation		1	0.00	0.00
Nitrate as N	353.2	1	30.00	30.00
Sulfate	375.4	1	0.00	0.00
Methane Subcontract		1	95.00	95.00
TOTALS		1	345.00	345.00

LABORATORY ORDER CONTINUED ON PAGE 5

ORDER NO WP-3906

Project Manager: Andrea J. Colby
ORDER DATE: 09/14/99
PHONE: 850/385-9899
FAX: 850/385- 50
DUE: 14 OCT
FAC.ID: CNC CHARLESTON

REPORT TO: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
FOSTER PLAZA 7, 661 ANDERSEN DR.
PITTSBURGH, PA 15220

PHONE: 412/921-7090
PO: N7912-P99264
PROJECT: CTO #68

SAMPLED BY: P.HALVERSON/T.THOMPSON/J.KRIEGERDELIVERED BY: FEDEXDISPOSE: AFTER 13

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
7	WP3906-47	16GLM7D01	12 SEP 0755	14 SEP	AQ
	WP3906-48	26GLP1201	13 SEP 1345		
	WP3906-49	26GLP1301	13 SEP 1355		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	3	75.00	225.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	3	125.00	375.00
TOTALS		3	200.00	600.00

ORDER NOTE: QC-II+ W/NARRATIVE
DD(KAS007QC-DB3)
CNC CHARLESTON
REPORT COPY: MS. LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.
PITTSBURGH,PA. 15220
REPORT AND DISK

INVOICE: With Report

TOTAL ORDER AMOUNT $13,795.00
This is NOT an Invc e

AJC/BKR
09-14Please contact KATAHDIN ANALYTICAL SERVICES promptly if you have any questi

KATAHDIN ANALYTICAL SERVICES

Summary of Report Notes

Report Note	Note Text
A-1	Insufficient sample was provided to enable laboratory to achieve the laboratory's standard Practical Quantitation Level.
E	'E' flag indicates an estimated value. The analyte was detected in the sample at a concentration greater than the standard calibration range.
J	'J' flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.
O-2	Sample dilution required for quantitation of one or more target analytes; therefore, standard laboratory Practical Quantitation Level (PQL) could not be achieved.

KATAHDIN ANALYTICAL SERVICES

Summary of Report Notes

Report Note	Note Text
B	'B' flag denotes detection of this analyte in the laboratory method blank analyzed concurrently with the sample.
E	'E' flag indicates an estimated value. The analyte was detected in the sample at a concentration greater than the standard calibration range.
J	'J' flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.
O-2	Sample dilution required for quantitation of one or more target analytes; therefore, standard laboratory Practical Quantitation Level (PQL) could not be achieved.

INORGANIC ANALYSIS DATA SHEET

Lab Name: Katahdin Analytical Services **Client Field ID:** 25GLM0301

Matrix: WATER **SDG Name:** WP3906

Percent Solids: 0.00 **Lab Sample ID:** WP3906-042

Concentration Units (ug/L or mg/Kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	DF
7439-92-1	LEAD	1.4	B		P	1

Comments:

FORM I - IN

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3906-42
SDG: WP3906
Report Date: 10/6/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 9/29/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25GLM0301	AQ	9/12/99	9/14/99	9/17/99	DPD	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<10	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	81	%	1.0		
2-FLUOROBIPHENYL	80	%	1.0		
TERPHENYL-D14	69	%	1.0		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client:	Paul Calligan Tetra Tech NUS 1401 Oven Park Dr. Suite 102 Tallahassee, FL 32308	**Lab Number:**	WP3906-42
		SDG:	WP3906
		Report Date:	10/12/99
		PO No. :	N7912-P99264
		Project:	CTO #68
Proj. ID:	CNC CHARLESTON	**% Solids:**	N/A
		Method:	SW8260
		Date Analyzed:	9/20/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25GLM0301	AQ	9/12/99	9/14/99	9/20/99	KMC	5030	KMC

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	99	%	1.0		
1,2-DICHLOROETHANE-D4	92	%	1.0		
TOLUENE-D8	101	%	1.0		
P-BROMOFLUOROBENZENE	104	%	1.0		

Report Notes:

INORGANIC ANALYSIS DATA SHEET

Lab Name: Katahdin Analytical Services **Client Field ID:** 25GLM0801

Matrix: WATER **SDG Name:** WP3906

Percent Solids: 0.00 **Lab Sample ID:** WP3906-043

Concentration Units (ug/L or mg/Kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	DF
7439-92-1	LEAD	1.3	B		P	1

Comments:

FORM I - IN

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client:	Paul Calligan Tetra Tech NUS 1401 Oven Park Dr. Suite 102 Tallahassee, FL 32308	**Lab Number:**	WP3906-43
		SDG:	WP3906
		Report Date:	10/6/99
		PO No. :	N7912-P99264
		Project:	CTO #68
		% Solids:	N/A
Proj. ID:	CNC CHARLESTON	**Method:**	EPA 8270
		Date Analyzed:	9/29/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25GLM0801	AQ	9/12/99	9/14/99	9/17/99	DPD	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<12	ug/L	1.2	12	10
2-METHYLNAPHTHALENE	<12	ug/L	1.2	12	10
ACENAPHTHYLENE	<12	ug/L	1.2	12	10
ACENAPHTHENE	<12	ug/L	1.2	12	10
FLUORENE	<12	ug/L	1.2	12	10
PHENANTHRENE	<12	ug/L	1.2	12	10
ANTHRACENE	<12	ug/L	1.2	12	10
FLUORANTHENE	<12	ug/L	1.2	12	10
PYRENE	<12	ug/L	1.2	12	10
BENZO[A]ANTHRACENE	<12	ug/L	1.2	12	10
CHRYSENE	<12	ug/L	1.2	12	10
BENZO[B]FLUORANTHENE	<12	ug/L	1.2	12	10
BENZO[K]FLUORANTHENE	<12	ug/L	1.2	12	10
BENZO[A]PYRENE	<12	ug/L	1.2	12	10
INDENO[1,2,3-CD]PYRENE	<12	ug/L	1.2	12	10
DIBENZ[A,H]ANTHRACENE	<12	ug/L	1.2	12	10
BENZO[G,H,I]PERYLENE	<12	ug/L	1.2	12	10
NITROBENZENE-D5	74	%	1.2		
2-FLUOROBIPHENYL	88	%	1.2		
TERPHENYL-D14	104	%	1.2		

Report Notes: A-1

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Katahdin ANALYTICAL SERVICES

Client:	Paul Calligan Tetra Tech NUS 1401 Oven Park Dr. Suite 102 Tallahassee, FL 32308	**Lab Number:**	WP3906-43
		SDG:	WP3906
		Report Date:	10/12/99
		PO No. :	N7912-P99264
		Project:	CTO #68
Proj. ID:	CNC CHARLESTON	**% Solids:**	N/A
		Method:	SW8260
		Date Analyzed:	9/21/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25GLM0801	AQ	9/12/99	9/14/99	9/21/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	109	%	1.0		
1,2-DICHLOROETHANE-D4	104	%	1.0		
TOLUENE-D8	106	%	1.0		
P-BROMOFLUOROBENZENE	103	%	1.0		

Report Notes:

INORGANIC ANALYSIS DATA SHEET

Lab Name: **Katahdin Analytical Services**

Client Field ID: 25GLM0601

Matrix: WATER

SDG Name: WP3906

Percent Solids: 0.00

Lab Sample ID: WP3906-044

Concentration Units (ug/L or mg/Kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	DF
7439-92-1	LEAD	1.09	U		P	1

Comments:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client:	Paul Calligan Tetra Tech NUS 1401 Oven Park Dr. Suite 102 Tallahassee, FL 32308	**Lab Number:**	WP3906-44
		SDG:	WP3906
		Report Date:	10/6/99
		PO No. :	N7912-P99264
		Project:	CTO #68
Proj. ID:	CNC CHARLESTON	**% Solids:**	N/A
		Method:	EPA 8270
		Date Analyzed:	9/29/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25GLM0601	AQ	9/12/99	9/14/99	9/17/99	DPD	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<10	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	81	%	1.0		
2-FLUOROBIPHENYL	104	%	1.0		
TERPHENYL-D14	95	%	1.0		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3906-44
SDG: WP3906
Report Date: 10/12/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 9/21/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25GLM0601	AQ	9/12/99	9/14/99	9/21/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	E260	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	108	%	1.0		
1,2-DICHLOROETHANE-D4	104	%	1.0		
TOLUENE-D8	106	%	1.0		
P-BROMOFLUOROBENZENE	103	%	1.0		

Report Notes: E

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3906-44DL
SDG: WP3906
Report Date: 10/12/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 9/22/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25GLM0601	AQ	9/12/99	9/14/99	9/22/99	KMC	5030	KMC

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<25	ug/L	5.0	25	5
TOLUENE	<25	ug/L	5.0	25	5
1,2-DIBROMOETHANE	<25	ug/L	5.0	25	5
ETHYLBENZENE	<25	ug/L	5.0	25	5
NAPHTHALENE	<25	ug/L	5.0	25	5
MTBE	220	ug/L	5.0	25	5
TOTAL XYLENES	<25	ug/L	5.0	25	5
DIBROMOFLUOROMETHANE	111	%	5.0		
1,2-DICHLOROETHANE-D4	102	%	5.0		
TOLUENE-D8	107	%	5.0		
P-BROMOFLUOROBENZENE	104	%	5.0		

Report Notes: O-2

INORGANIC ANALYSIS DATA SHEET

Lab Name: Katahdin Analytical Services

Client Field ID: 25GLM0401

Matrix: WATER

SDG Name: WP3906

Percent Solids: 0.00

Lab Sample ID: WP3906-045

Concentration Units (ug/L or mg/Kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	DF
7439-92-1	LEAD	1.09	U		P	1

Comments:

FORM I - IN

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3906-45
SDG: WP3906
Report Date: 10/6/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 9/29/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25GLM0401	AQ	9/13/99	9/14/99	9/20/99	DS	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<10	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	70	%	1.0		
2-FLUOROBIPHENYL	80	%	1.0		
TERPHENYL-D14	100	%	1.0		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP3906-45
SDG: WP3906
Report Date: 10/12/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 9/21/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25GLM0401	AQ	9/13/99	9/14/99	9/21/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	110	%	1.0		
1,2-DICHLOROETHANE-D4	106	%	1.0		
TOLUENE-D8	106	%	1.0		
P-BROMOFLUOROBENZENE	104	%	1.0		

Report Notes:

INORGANIC ANALYSIS DATA SHEET

Lab Name: Katahdin Analytical Services
Client Field ID: 25GLM0701
Matrix: WATER
SDG Name: WP3906
Percent Solids: 0.00
Lab Sample ID: WP3906-046

Concentration Units (ug/L or mg/Kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	DF
7439-92-1	LEAD	1.09	U		P	1

Comments:

FORM I - IN

Katahdin ANALYTICAL SERVICES

CLIENT: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

Lab Number : WP-3906-46
Report Date: 10/13/99
PO No. : N7912-P99264
Project : CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
25GLM0701	Aqueous	P.HALVERSON/ T.THOMPSON/ J.KRIEGER	09/13/99	09/14/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Nitrate as N	0.16	mg/L	1.0	0.050	353.2	09/14/99	KW	
Sulfate	160.	mg/L	10	1.0	300.0	09/24/99	CF	

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

10/13/99

LJO/baeajc(dw)/msm
PI14NOW1
CC: MS. LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client:	Paul Calligan Tetra Tech NUS 1401 Oven Park Dr. Suite 102 Tallahassee, FL 32308	**Lab Number:**	WP3906-46
		SDG:	WP3906
		Report Date:	10/6/99
		PO No. :	N7912-P99264
		Project:	CTO #68
Proj. ID:	CNC CHARLESTON	**% Solids:**	N/A
		Method:	EPA 8270
		Date Analyzed:	9/30/99

Sample Description	**Matrix**	**Sampled Date**	**Rec'd Date**	**Ext. Date**	**Ext'd By**	**Ext. Method**	**Analyst**
25GLM0701	AQ	9/13/99	9/14/99	9/20/99	DS	EPA 3510	KRT

Compound	**Result**	**Units**	**DF**	**Sample PQL**	**Method PQL**
NAPHTHALENE	<10	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	49	%	1.0		
2-FLUOROBIPHENYL	58	%	1.0		
TERPHENYL-D14	103	%	1.0		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client:	Paul Calligan Tetra Tech NUS 1401 Oven Park Dr. Suite 102 Tallahassee, FL 32308	**Lab Number:**	WP3906-46
		SDG:	WP3906
		Report Date:	10/12/99
		PO No. :	N7912-P99264
		Project:	CTO #68
Proj. ID:	CNC CHARLESTON	**% Solids:**	N/A
		Method:	SW8260
		Date Analyzed:	9/21/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25GLM0701	AQ	9/13/99	9/14/99	9/21/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	109	%	1.0		
1,2-DICHLOROETHANE-D4	104	%	1.0		
TOLUENE-D8	105	%	1.0		
P-BROMOFLUOROBENZENE	103	%	1.0		

Report Notes:

3P

PREPARATION BLANKS

Lab Name: Katahdin Analytical Services

Sample ID: PBWPI22ICW0

Matrix: WATER

SDG Name: WP3906

QC Batch ID: PI22ICW0

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	RESULT	C
LEAD	1.090	U

LABORATORY CONTROL SAMPLES

Lab Name: Katahdin Analytical Services **Sample ID:** LCSWPI22ICW0

Matrix: WATER **SDG Name:** WP3906

QC Batch ID: PI22ICW0

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	TRUE	FOUND	% R	LIMITS (%)	
LEAD	500.0	552.13	110.4	80	120

SPIKE SAMPLE RECOVERY

Lab Name: Katahdin Analytical Services

Matrix: WATER

Percent Solids: 0.00

Client Field ID: 25GLM0701S

SDG Name: WP3906

Lab Sample ID: WP3906-046S

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	Spiked Sample Result	C	Sample Result	C	Spike Added	%R	Q	Control Limits (%R) Low	Control Limits (%R) High	M
LEAD	538.0900		0.6200	U	500	107.6		75	125	P

Comments:

5A

SPIKE SAMPLE RECOVERY

Lab Name: Katahdin Analytical Services

Matrix: WATER

Percent Solids: 0.00

Client Field ID: 25GLM0701S

SDG Name: WP3906

Lab Sample ID: WP3906-046P

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	Spiked Sample Result	C	Sample Result	C	Spike Added	%R	Q	Control Limits (%R) Low	High	M
LEAD	504.6900		0.6200	U	500	100.9		75	125	P

Comments:

5D

SPIKE DUPLICATES

Lab Name: Katahdin Analytical Services

Matrix: WATER

Percent Solids: 0.00

Client Field ID: 25GLM0701

SDG Name: WP3906

Lab Sample ID: WP3906-046

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	Control Limits	Spike Result	C	Spike Dup. Result	C	RPD	Q	M
LEAD		538.0900		504.6900		6.4		P

Comments:

FORM VD - IN

Katahdin Analytical Services, Inc.
Quality Control Report

Method Blank and Laboratory Control Sample Results

Client: Tetra Tech NUS	
Work Order: WP3906	

Parameter	Date of Prep	Date of Analysis	METHOD BLANK RESULTS Units	Concentration Measured in Blank	Acceptance Range	Practical Quantitation Level**	LABORATORY CONTROL SAMPLE RESULTS Units	True Value	Measured Value	Percent Recovered	Acceptance Range (%)	Acceptance Range (mg/kg)
Nitrate-Nitrogen	14-Sep-99	14-Sep-99	mg/L	< 0.050	< 0.050	0.050	mg/L	1.00	0.931	93.1	80-120	
Sulfate	24-Sep-99	24-Sep-99	mg/L	< 1.0	< 1.0	1.0	mg/L	10	10	100.0	80-120	
	04-Oct-99	04-Oct-99	mg/L	< 1.0	< 1.0	1.0	mg/L	250	223	89.2	83-112	@

** Practical quantitation level is the lowest concentration measurable for samples with normal chemical and physical composition during routine laboratory operations.

DATA QUALITY COMMENTS:
Results of all quality control measurements are within the laboratory and method specified acceptance range except as noted.

@ The laboratory uses the internally established statistical 99% confidence range as the acceptance range for this LCS.

Katahdin Analytical Services, Inc.
Quality Control Report

Duplicate and Matrix Spike/Matrix Spike Duplicate Results

Client: Tetra Tech NUS	
Work Order: WP3906	

		DUPLICATE RESULTS						*MATRIX SPIKE/MATRIX SPIKE DUPLICATE RESULTS*									
			Sample				Acceptance	Concentration or Quantity					Matrix Spike Recovery (%)				
Parameter	Katahdin Sample No	Units	Measurements Rep 1	Rep 2	Mean Conc	RPD (%)	Range for RPD (%)	Units	Sampl Only	Spike Added	Sample +Spike Dup 1	Sample +Spike Dup 2	Sample +Spike Dup 1	Sampl +Spik Dup	Acceptance Range (%)	RPD (%)	Acceptance Range (%)
Nitrate - N	WP3906-46	mg/L	0.161	0.163	0.162	1.2	0-20	mg/L	0.16	0.5	0.396		47.2 *		75-125		0-20

RPD = Relative percent difference, which is the absolute value of the difference between two replicate results divided by the mean concentration then multiplied by 100%.

DATA QUALITY COMMENTS:
Results of all quality control measurements are within the laboratory or contract specified acceptance range except as noted. The laboratory does not use the sample duplicate and matrix spike acceptance ranges as acceptance criteria for a specific analysis. Sample duplicate and matrix spike data are used to evaluate method performance in the environmental sample matrix only. Please refer to LCS data for assessment of quality control for each parameter.

* Matrix spike recovery is outside the laboratory's specified acceptance range indicating potential sample matrix interference and potential bias of reported value for this parameter.

0000181

4B

SEMIVOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK;091799

Lab Name: Katahdin Analytical Services SDG No.: WP3906

Lab File ID: X2921 Lab Sample ID: SBLK;091799

Instrument ID: 5970-X Date Extracted: 9/17/99

GC Column: RTX-5 ID: 0.25 (mm) Date Analyzed: 09/27/99

Matrix: (soil/water) WATER Time Analyzed: 16:30

Level: (low/med) LOW

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S :

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCS;091799	LCS;091799	X2922	9/27/99	5:14:00 PM
42GLM1601	WP3906-13	X2923	9/27/99	5:59:00 PM
42GLM1001	WP3906-19	X2924	9/27/99	6:43:00 PM
42GLM1001MS	WP3906-19MS	X2925	9/27/99	7:27:00 PM
42GLM1001MSD	WP3906-19MSD	X2926	9/27/99	8:11:00 PM
42GLM0801	WP3906-21	X2928	9/27/99	9:39:00 PM
42GLM1001	WP3906-19DL	X2933	9/28/99	11:59:00 AM
42GLM1201	WP3906-20	X2934	9/28/99	12:43:00 PM
42GLM0601	WP3906-22	X2935	9/28/99	1:27:00 PM
42GLM0701D	WP3906-23	X2936	9/28/99	2:12:00 PM
42GLM0101D	WP3906-24	X2937	9/28/99	2:56:00 PM
42GLM1801	WP3906-25	X2938	9/28/99	3:40:00 PM
36GLM0601	WP3906-28	X2939	9/28/99	4:24:00 PM
36GLM0201	WP3906-29	X2940	9/28/99	5:09:00 PM
36GLM0301	WP3906-30	X2941	9/28/99	5:53:00 PM
42GLM0901	WP3906-32	X2943	9/28/99	7:22:00 PM
42GLM0101	WP3906-34	X2945	9/28/99	8:50:00 PM
42GLM0601	WP3906-22RA	X2947	9/29/99	10:07:00 AM
42GLM0701	WP3906-31	X2948	9/29/99	10:51:00 AM
42GLM1101	WP3906-33	X2949	9/29/99	11:35:00 AM
42GLM1301	WP3906-35	X2950	9/29/99	12:20:00 PM
25GLM0301	WP3906-42	X2951	9/29/99	1:04:00 PM
25GLM0801	WP3906-43	X2952	9/29/99	1:48:00 PM
25GLM0601	WP3906-44	X2953	9/29/99	2:32:00 PM
16GLM7D01	WP3906-47	X2954	9/29/99	3:17:00 PM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: SBLK;091799
SDG: WP3906
Report Date: 10/6/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 9/27/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
SBLK;091799	AQ	-	-	9/17/99	DPD	EPA 3510	SW

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<10	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	82	%	1.0		
2-FLUOROBIPHENYL	81	%	1.0		
TERPHENYL-D14	112	%	1.0		

Report Notes:

Katahdin Analytical Services
8270 LCS Recovery Sheet

Lab File: X2922 **Sample ID: LCS;091799** **Date Run: 9/27/99**

Analyst: SW **Time Injected: 5:14:00 PM** **Matrix: AQ**

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
2-METHYLNAPHTHALENE	50	33.1	*66	70-130
ACENAPHTHENE	50	34.4	*69	70-130
ACENAPHTHYLENE	50	34.5	*69	70-130
ANTHRACENE	50	45.7	91	70-130
BENZO[A]ANTHRACENE	50	44.5	89	70-130
BENZO[A]PYRENE	50	44.6	89	70-130
BENZO[B]FLUORANTHENE	50	44.5	89	70-130
BENZO[G,H,I]PERYLENE	50	46.5	93	70-130
BENZO[K]FLUORANTHENE	50	46.5	93	70-130
CHRYSENE	50	53.3	106	70-130
DIBENZ[A,H]ANTHRACENE	50	44.1	88	70-130
FLUORANTHENE	50	43.5	87	70-130
FLUORENE	50	35.5	71	70-130
INDENO[1,2,3-CD]PYRENE	50	41.0	82	70-130
NAPHTHALENE	50	31.3	*62	70-130
PHENANTHRENE	50	47.5	95	70-130
PYRENE	50	48.8	98	70-130

*** Out of Limits**

Katahdin Analytical Services

MS/MSD Report

Sample	File Name	Date Acquired	Time inj	Analyst	Matrix	Method
WP3906-19	X2924	9/27/99	6:43:00 PM	SW	AQ	8270_99
WP3906-19MS	X2925	9/27/99	7:27:00 PM	SW	AQ	8270_99
WP3906-19MSD	X2926	9/27/99	8:11:00 PM	SW	AQ	8270_99

Compound Name	Native (ug/L)	MS Spk Amount (ug/L)	MSD Spk Amount (ug/L)	MS Result (ug/L)	MSD Result (ug/L)	MS REC (%)	MSD REC (%)	Recovery Limits (%)	RPD (%)	RPD Limit (%)
CHRYSENE	0	56	54	45.8	44.6	82	82	60-140	2.6	30
ACENAPHTHENE	57.8	56	54	104	97.8	82	74	60-140	6.1	30
ACENAPHTHYLENE	0	56	54	35.9	37.2	64	69	60-140	3.6	30
ANTHRACENE	9.96	56	54	50.1	45.9	72	66	60-140	8.8	30
BENZO[A]ANTHRACENE	0	56	54	37.2	39.2	66	72	60-140	5.2	30
BENZO[A]PYRENE	0	56	54	35.2	41.3	63	76	60-140	16	30
BENZO[B]FLUORANTHENE	0	56	54	34.5	43.5	62	80	60-140	23	30
2-METHYLNAPHTHALENE	34.7	56	54	74.6	52.1	71	*32	60-140	*36	30
BENZO[K]FLUORANTHENE	0	56	54	34.0	42.4	61	78	60-140	22	30
PYRENE	13.2	56	54	57.6	58.9	79	85	60-140	2.2	30
DIBENZ[A,H]ANTHRACENE	0	56	54	35.2	37.8	63	70	60-140	7.1	30
FLUORANTHENE	20.8	56	54	59.1	61.9	68	76	60-140	4.6	30
FLUORENE	32.4	56	54	72.3	60.0	71	*51	60-140	18	30
INDENO[1,2,3-CD]PYRENE	0	56	54	38.2	32.0	68	*59	60-140	18	30
NAPHTHALENE	255	56	54	365	356	*197	*187	60-140	2.5	30
PHENANTHRENE	66.0	56	54	116	98.8	89	61	60-140	16	3
BENZO[G,H,I]PERYLENE	0	56	54	39.3	40.8	70	76	60-140	3.7	30

RPD =[(ms res - msd res) / (ms res + msd res)/2] * 100

* Out of Limits

4B

SEMIVOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK;092099

Lab Name: Katahdin Analytical Services SDG No.: WP3906

Lab File ID: X2931 Lab Sample ID: SBLK;092099

Instrument ID: 5970-X Date Extracted: 9/20/99

GC Column: RTX-5 ID: 0.25 (mm) Date Analyzed: 09/28/99

Matrix: (soil/water) WATER Time Analyzed: 10:30

Level: (low/med) LOW

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S :

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCS;092099	LCS;092099	X2932	9/28/99	11:14:00 AM
36GLM0201D	WP3906-14	X2955	9/29/99	4:01:00 PM
25GLM0401	WP3906-45	X2956	9/29/99	4:45:00 PM
26GLP1201	WP3906-48	X2958	9/29/99	6:13:00 PM
26GLP1301	WP3906-49	X2959	9/29/99	6:58:00 PM
25GLM0701	WP3906-46	X2962	9/30/99	8:46:00 AM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client:	Paul Calligan Tetra Tech NUS 1401 Oven Park Dr. Suite 102 Tallahassee, FL 32308	**Lab Number:**	SBLK;092099
		SDG:	WP3906
		Report Date:	10/6/99
		PO No. :	N7912-P99264
		Project:	CTO #68
Proj. ID:	CNC CHARLESTON	**% Solids:**	N/A
		Method:	EPA 8270
		Date Analyzed:	9/28/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
SBLK;092099	AQ	-	-	9/20/99	DS	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<10	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	84	%	1.0		
2-FLUOROBIPHENYL	93	%	1.0		
TERPHENYL-D14	90	%	1.0		

Report Notes:

Katahdin Analytical Services
8270 LCS Recovery Sheet

Lab File: X2932 **Sample ID:** LCS;092099 **Date Run:** 9/28/99

Analyst: SW **Time Injected:** 11:14:00 AM **Matrix:** AQ

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
2-METHYLNAPHTHALENE	50	37.9	76	70-130
ACENAPHTHENE	50	38.6	77	70-130
ACENAPHTHYLENE	50	40.3	80	70-130
ANTHRACENE	50	42.9	86	70-130
BENZO[A]ANTHRACENE	50	41.3	82	70-130
BENZO[A]PYRENE	50	41.0	82	70-130
BENZO[B]FLUORANTHENE	50	40.5	81	70-130
BENZO[G,H,I]PERYLENE	50	43.8	88	70-130
BENZO[K]FLUORANTHENE	50	42.3	84	70-130
CHRYSENE	50	50.7	101	70-130
DIBENZ[A,H]ANTHRACENE	50	39.2	78	70-130
FLUORANTHENE	50	42.4	85	70-130
FLUORENE	50	37.0	74	70-130
INDENO[1,2,3-CD]PYRENE	50	40.7	81	70-130
NAPHTHALENE	50	37.1	74	70-130
PHENANTHRENE	50	44.5	89	70-130
PYRENE	50	46.0	92	70-130

*** Out of Limits**

4A
VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKU21B

Lab Name: Katahdin Analytical Services SDG No.: WP3906

Lab File ID: U1000 Lab Sample ID: VBLKU21B

Date Analyzed: 09/21/99 Time Analyzed: 16:31

GC Column: RTX-624 ID: 0.18 (mm) Heated Purge: (Y/N) N

Instrument ID: 5973-U

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S :

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSU21B	LCSU21B	U0999	9/21/99	3:50:00 PM
25GLM0801	WP3906-43	U1009	9/21/99	10:05:00 PM
25GLM0601	WP3906-44	U1010	9/21/99	10:40:00 PM
25GLM0401	WP3906-45	U1011	9/21/99	11:16:00 PM
25GLM0701	WP3906-46	U1012	9/21/99	11:52:00 PM

KATAHDIN ANALYTICAL SERVICES

REPORT OF ANALYTICAL RESULTS

Client:	Paul Calligan Tetra Tech NUS 1401 Oven Park Dr. Suite 102 Tallahassee, FL 32308		**Lab Number:**	VBLKU21B
			SDG:	WP3906
			Report Date:	10/12/99
			PO No. :	N7912-P99264
			Project:	CTO #68
Proj. ID:	CNC CHARLESTON		**% Solids:**	N/A
			Method:	SW8260
			Date Analyzed:	9/21/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKU21B	AQ	-	-	9/21/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	105	%	1.0		
1,2-DICHLOROETHANE-D4	99	%	1.0		
TOLUENE-D8	104	%	1.0		
P-BROMOFLUOROBENZENE	102	%	1.0		

Report Notes:

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: U0999 **Sample ID: LCSU21B** **Date Run: 9/21/99**

Analyst: JSS **Time Injected: 3:50:00 PM** **Matrix: AQ**

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	50.2	100	60-140
BENZENE	50	50.3	101	60-140
ETHYLBENZENE	50	49.0	98	60-140
MTBE	50	43.1	86	60-140
NAPHTHALENE	50	45.4	91	60-140
TOLUENE	50	52.7	105	60-140
TOTAL XYLENES	150	143	96	60-140

*** Out of Limits**

4A

VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKU22A

Lab Name: Katahdin Analytical Services SDG No.: WP3906

Lab File ID: U1018 Lab Sample ID: VBLKU22A

Date Analyzed: 09/22/99 Time Analyzed: 10:44

GC Column: RTX-624 ID: 0.18 (mm) Heated Purge: (Y/N) N

Instrument ID: 5973-U

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S :

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSU22A	LCSU22A	U1017	9/22/99	9:54:00 AM
25GLM0601	WP3906-44DL	U1019	9/22/99	11:32:00 AM
23GLM0401	WP3906-36DL	U1021	9/22/99	12:47:00 PM
36GLM0501MS	WP3906-5MS	U1025	9/22/99	3:14:00 PM
36GLM0501MSD	WP3906-5MSD	U1026	9/22/99	3:50:00 PM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: VBLKU22A
SDG: WP3906
Report Date: 10/12/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 9/22/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKU22A	AQ	-	-	9/22/99	KMC	5030	KMC

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	110	%	1.0		
1,2-DICHLOROETHANE-D4	99	%	1.0		
TOLUENE-D8	107	%	1.0		
P-BROMOFLUOROBENZENE	104	%	1.0		

Report Notes:

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: U1017 **Sample ID: LCSU22A** **Date Run: 9/22/99**

Analyst: KMC **Time Injected: 9:54:00 AM** **Matrix: AQ**

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	49.7	99	60-140
BENZENE	50	51.1	102	60-140
ETHYLBENZENE	50	48.6	97	60-140
MTBE	50	41.8	84	60-140
NAPHTHALENE	50	41.2	82	60-140
TOLUENE	50	53.6	107	60-140
TOTAL XYLENES	150	141	94	60-140

*** Out of Limits**

MS/MSD Report

Sample	File Name	Date Acquired	Time inj	Analyst	Matrix	Method
WP3906-5	Q6636	9/15/99	7:27:00 PM	HMP	AQ	8260_99
WP3906-5MS	U1025	9/22/99	3:14:00 PM	KMC	AQ	8260_99
WP3906-5MSD	U1026	9/22/99	3:50:00 PM	KMC	AQ	8260_99

Compound Name	Native (ug/L)	MS Spk Amount (ug/L)	MSD Spk Amount (ug/L)	MS Result (ug/L)	MSD Result (ug/L)	MS REC (%)	MSD REC (%)	Recovery Limits (%)	RPD (%)	RPD Limit (%)
TOTAL XYLENES	0	150	150	134	123	89	82	60-140	8.6	20
TOLUENE	0	50	50	51.1	46.5	102	93	60-140	9.4	20
NAPHTHALENE	0	50	50	45.6	42.6	91	85	60-140	6.8	20
MTBE	0	50	50	45.4	43.4	91	87	60-140	4.5	20
ETHYLBENZENE	0	50	50	45.6	41.8	91	84	60-140	8.7	20
BENZENE	0	50	50	48.5	44.6	97	89	60-140	8.4	20
1,2-DIBROMOETHANE	0	50	50	53.6	48.8	107	98	60-140	9.4	20

RPD =[(ms res - msd res) / (ms res + msd res)/2] * 100

* Out of Limits

ENSR
Air Toxics Specialty Laboratory
42 Nagog Park
Acton, MA 01720

DATE: October 12, 1999

TO: Andrea Colby
Katahdin Analytical
340 County Road No. 5
P.O. Box 720
Westbrook, ME 04098

Re: Organic Analyses of Aqueous Samples for Methane by Gas Chromatography/ Flame Ionization Detection (GC/FID)- **WP3906**

PROJECT #: **8601-008-200**

LAB ID #: **990175**

ANALYTICAL PROCEDURE:

Nine (9) aqueous samples were analyzed for methane under the guidelines of SW-846 Method 3810.

A Hewlett Packard 5890 series II gas chromatograph (GC) equipped with a Hewlett Packard flame ionization detector (FID) was used for the analysis. A 1.0 mL headspace aliquot of each sample was injected into the column for analysis. The operating conditions of the GC/FID are listed in Table 1. A five point calibration was performed for the target analyte, methane.

No problems occurred during sample receipt, log-in, or analysis.

QUALITY CONTROL:

1. A laboratory blank was analyzed daily in the same manner as the samples. Methane was not detected in the blank.

2. MS/MSD analyses were performed on the following sample:
   WP3906-28

   The recoveries and relative percent differences of methane were within the QC acceptance limits.

3. A duplicate analysis was performed on the following sample:
   WP3906-34(A)

4. A laboratory control spike was analyzed daily. The recovery of methane was within the QC acceptance limits.

Date Samples Received by the Laboratory: 9/16/99

Date Analysis Started: 9/24/99

C:\My Documents\Kat 990175 990178 990180\katrpt3.doc

Katahdin Analytical Services
340 County Road No. 5
P.O. Box 720
Westbrook, ME 04098
Tel: (207) 874-2400
Fax: (207) 775-4029

CHAIN of CUSTODY

PLEASE PRINT IN PEN

Page ____ of __

Client	Contact	Phone #	Fax #
Katahdin Analytical Services	Andrea Colby	( )	( )

Address	City	State	Zip Code
as above			

Purchase Order #   Proj. Name / No.   Katahdin Quote #

Bill (if different than above)   Address

Sampler (Print / Sign)   Copies To:

LAB USE ONLY

WORK ORDER #:

KATAHDIN PROJECT MANAGER ____________

REMARKS: Sub to ENCR

SHIPPING INFO: ☒ FED EX ☐ UPS ☐ CLIENT

AIRBILL NO:

TEMP°C ________ ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

ANALYSIS AND CONTAINER TYPE PRESERVATIVES

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	[illegible]					Lab ID				
	WP3906-28	9-13-99/1015	AQ	3	X					1				
	WP3906-29	/1055		3	X					2				
	WP3906-30	/1131		3	X					3				
	WP3906-31	/1202		3	X					4				
	WP3906-32	/1206		3	X					5				
	WP3906-33	/1204		3	X					6				
	WP3906-34	/1435		3	X					7				
	WP3906-35	/1449		3	X					8				
	WP3906-46	/1115		3	X					9				
		/												
		/												
		/												
		/												
		/												
		/												
		/												
		/												

Filt. ☐Y☐N (each analysis column)

COMMENTS
QC-II + w/Narrative DL (KA2007QC-DB3) Results Due: 10-13-99

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
[illegible]	9-15-99 1625			9/16/99 1440	[signature]
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

SAMPLE LOG-IN & RECEIPT CHECKLIST

Client/Proj #: Katahdin WP3906 / 8601-008-200

Proj Mgr: M. Hoyt

Lab Pool #: 990175

Inspected & Logged in by: A. MacDuff

Date Time: 9/16/99 @ 1440

Sample Matrix	Number of Samples	Analysis Requested	Analyze by (date)	Storage Location
Aqueous	9	CH_4	9/30/99 Due 10/13	R1

Circle the appropriate response:

1) Shipped / Hand delivered

2) COC present / not present on receipt

3) COC Tape present / not present on shipping container

4) Samples broken / intact on receipt

5) Samples ambient / chilled on receipt Temp blank = 5°C

6) Samples preserved correctly / incorrectly / none recommended

7) Received within / outside holding time

8) COC tapes present / not present on samples

9) Discrepancies / NO discrepancies noted between COCs and samples

Additional Comments: 3 VOAs per sample

25GLM0701

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

WP3906-46(C)

Lab Name: ENSR Contract:

Lab Code: Case No.: SAS NO.: SDG NO.:

Matrix: (soil/water) water

Lab Sample ID: 990175-9

Sample wt / vol: 32.5 ml (g/ml)

Lab File ID: KAT_008

Level: (low/med) low

Date Received: 9/16/99

% Moisture: NA

Date Analyzed: 9/24/99

GC Column: Carboxen 1004 OD: 1/16"

Dilution Factor: 1

Soil Extract Volume: NA (µl)

Soil Aliquot Volume: NA (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) µg/L	Q
74-82-8	Methane	6.5	

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK01

Lab Name: _____ ENSR ___________ Contract: _____________

Lab Code: _______________ Case No.: _________ SAS NO.: _________ SDG NO.: ___________

Matrix: (soil/water) _____ water ______

Lab Sample ID: MB990175

Sample wt / vol: ____ 32.5 ml _____ (g/ml)

Lab File ID: ___KAT_006_________

Level: (low/med) _______ low _______

Date Received:___NA __________

% Moisture: _____ NA _________

Date Analyzed:___9/24/99 __________

GC Column: _ Carboxen 1004 __ OD: ___ 1/16" ___

Dilution Factor:_____ 1 ______________

Soil Extract Volume: _____ NA ____ (µl)

Soil Aliquot Volume: ____ NA ____ (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) __ µg/L __	Q
74-82-8	Methane	5.2	U

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

LCS01

Lab Name: _____ ENSR ___________ Contract: _____________

Lab Code: _______________ Case No.: _________ SAS NO.: _________ SDG NO.: ____________

Matrix: (soil/water) _____ water ______ Lab Sample ID: LCS990175

Sample wt / vol: ____ 32.5 ml ______ (g/ml) Lab File ID: ___KAT_007__________

Level: (low/med) _______ low _______ Date Received:___NA __________

% Moisture: _____ NA _________ Date Analyzed:__9/24/99 __________

GC Column: _ Carboxen 1004 __ OD: ___ 1/16" ___ Dilution Factor:_____ 1_____________

Soil Extract Volume: _____ NA ____ (µl) Soil Aliquot Volume: ____ NA ____ (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) __ µg/L __	Q
74-82-8	Methane	210	

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

WP3906-28(B) MS

Lab Name: ENSR Contract:

Lab Code: Case No.: SAS NO.: SDG NO.:

Matrix: (soil/water) water

Lab Sample ID: 990175-1 MS

Sample wt / vol: 32.5 ml (g/ml)

Lab File ID: KAT_023

Level: (low/med) low

Date Received: 9/16/99

% Moisture: NA

Date Analyzed: 9/24/99

GC Column: Carboxen 1004 OD: 1/16"

Dilution Factor: 1

Soil Extract Volume: NA (μl)

Soil Aliquot Volume: NA (μl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (μg/L or PPMv) μg/L	Q
74-82-8	Methane	340	

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

WP3906-28(C) MSD

Lab Name: ENSR Contract:

Lab Code: Case No.: SAS NO.: SDG NO.:

Matrix: (soil/water) water

Lab Sample ID: 990175-1 MSD

Sample wt / vol: 32.5 ml (g/ml)

Lab File ID: KAT_024

Level: (low/med) low

Date Received: 9/16/99

% Moisture: NA

Date Analyzed: 9/24/99

GC Column: Carboxen 1004 OD: 1/16"

Dilution Factor: 1

Soil Extract Volume: NA (µl)

Soil Aliquot Volume: NA (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) µg/L	Q
74-82-8	Methane	350	

LABORATORY CONTROL SPIKE RECOVERY

Lab Name: ____ ENSR ______________ Contract: ____________________

Lab Code: ____________ Case NO.: ___________ SAS NO.: __________ SDG NO.: ____________

Laboratory Control Sample No: ______ LCS01 ____________________

COMPOUND	SPIKE ADDED (µg/L)	LCS CONCENTRATION (µg/L)	LCS % REC #	QC LIMITS REC.
Methane	205.0	206.7	101%	50 - 150

* - Values outside of QC limits.

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: ____ ENSR ______________ Contract: __________________

Lab Code: ________________ Case NO.: _____________ SAS NO.: __________ SDG NO.: ___________

Matrix Spike - EPA Sample NO.: __WP3906-28 _____________

COMPOUND	SPIKE ADDED (µg/L)	SAMPLE CONCENTRATION (µg/L)	MS CONCENTRATION (µg/L)	MS % REC #	QC LIMITS REC.
Methane	205.0	189	344.8	76%	50-150

COMPOUND	SPIKE ADDED (µg/L)	MSD CONCENTRATION (µg/L)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Methane	205.0	345.8	77%	0.68%	50	50-150

Spike recovery: _____ 0 ______ out of ____ 2 ___ outside limits.
RPD: _____ 0 ____ out of ___ 1 ____ outside limits.

Comments:

Katahdin
ANALYTICAL SERVICES

SITE 25
GW

October 20, 1999

Mr. Paul Calligan
Tetra Tech Nus
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

RE: Katahdin Lab Number: WP4035
Project ID: CNC Charleston
Project Manager: Ms. Andrea J.Colby
Sample Receipt Date(s): 9/22/99

Dear Mr. Calligan:

Please find enclosed the following information:

* Report of Analysis
* Quality Control Data Summary
* Chain of Custody
* Confirmation

Should you have any questions or comments concerning this Report of Analysis, please do not hesitate to contact the project manager listed above. This cover letter is an integral part of the ROA.

We appreciate your continued use of our laboratory and look forward to working with you in the future. The following signature indicates technical review and acceptance of the data.

Sincerely,

KATAHDIN ANALYTICAL SERVICES

Patricia Gomez
Authorized Signature

10/20/99
Date

340 County Road No. 5
P.O. Box 720, Westbrook, ME 04098
Tel: (207) 874-2400 Fax: (207) 775-4029

http://katahdinlab.com

210 West Road No. 5, Portsmouth, NH 03801
Tel: (603) 431-5777 Fax: (603) 436-3356

SDG NARRATIVE
KATAHDIN ANALYTICAL SERVICES
TETRA TECH NUS
CASE CNC CHARLESTON

Sample Receipt

The following samples were received on September 22, 1999 and were logged in under Katahdin Analytical Services work order number WP4035 for a hardcopy due date of October 22, 1999.

KATAHDIN Sample No.	TTNUS Sample Identification	GEL Sample Identification
WP4035-1	22GLM0301	
WP4035-2	22GLM0401	
WP4035-3	22GLM0601	
WP4035-4	25GLM0101	
WP4035-5	25GLM0501	
WP4035-6	25GLM0501D	
WP4035-7	25GLX0201	
WP4035-8	25GLX0401	
WP4035-9	22GLM0301D	
WP4035-10	25TL00201	
WP4035-11	36SLB020405	9909644-05
WP4035-12	36SLB050405	9909644-06
WP4035-13	36SLB030405	9909644-07

The samples were logged in for the analyses specified on the chain of custody form. All problems encountered and resolved during sample receipt have been documented on the applicable chain of custody forms.

Sample analyses have been performed by the methods as noted herein.

Volatile Organic Analysis

Three soil/sediment and ten aqueous samples were received by the Katahdin Analytical Services, Inc. GC/MS laboratory on September 22, 1999 and were specified to be analyzed by USEPA method 8260B for the analytes benzene, toluene, ethylbenzene, xylenes, MTBE, naphthalene, and EDB.

Analyses for this workorder were performed on the 5973-U (aqueous), 5970-Q (aqueous), and 5972-M (low level soils) instruments. A VSTD050 (50 ppb standard) was used for the continuing calibration standard. Internal standard and surrogate compounds were also spiked at 50 ppb.

Batch QC (VBLK, and LCS) was performed in each twelve-hour window. Results are included in this data package. The LCS QC samples were spiked with the entire list of compounds quantitated for at 50 ppb. No matrix spike/matrix spike duplicate analysis was performed on any of the samples in this workorder.

Analyses of samples WP4035-1 and -9 yielded concentrations of 1,1-dichloroethane over the upper limit of the calibration curve. Since this analyte was not requested by the client to be reported, no laboratory action was taken.

Initial analyses of samples WP4035-5 and -6 were performed at 1:50 dilutions due to the matrix, with target analyte concentrations still over the upper limit of the calibration curve, as well as surrogate recovery deviations. Reanalyses occurred at 1:200 dilutions successfully. For each sample, both sets of data are included in this data package.

Several manual integrations were performed due to split peaks; all have been flagged with a "M" (software-generated) on the pertinent quantitation reports. All "M" flags have been dated and initialed by the analyst performing the integration. In addition, all "M" flags have been reviewed and approved by the GC/MS supervisor. Copies of each manual integration are included in the pertinent quantitation reports.

No other protocol deviations were noted by the volatile organics staff.

Semivolatile Organic Analysis

Three soil/sediment and nine aqueous samples were received by Katahdin Analytical Services laboratory on September 22, 1999 for analysis in accordance with 8270C for a client specified PAH list of analytes.

Extraction of the soil samples occurred following USEPA method 3550 on September 24 and 27, 1999. A laboratory control spike was extracted in each batch. Extraction of all of the aqueous samples occurred following USEPA method 3510 on September 23, 1999. A laboratory control sample/laboratory control sample duplicate was extracted in the batch.

Initial analyses of samples WP4035-5 and -6 yielded target analyte concentrations over the upper limit of the calibration curve. Reanalyses occurred at 1:4 dilutions successfully. For each sample, both sets of data are included in this data package.

Initial analysis of sample WP4035-3 yielded internal standard area recovery deviations. Reanalysis yielded similar results, confirming matrix interference. Both sets of data are included in the data package for this sample.

Several manual integrations were performed due to split peaks; all have been flagged with a "M" by the data system. All manual integrations have been dated and initialed by the responsible analyst. Copies of each manual integration are included in the data package. All manual integrations have been reviewed and approved by the GC/MS supervisor.

No other protocol deviations were noted by the semivolatiles organics staff.

Metals Analysis

The samples of Katahdin Work Order WP4035 were prepared and analyzed for metals in accordance with the "Test Methods for Evaluating Solid Waste", SW-846, November 1986, Third Edition.

Inductively-Coupled Plasma (ICP) Atomic Emission Spectroscopic Analysis

Aqueous-matrix Katahdin Sample Nos. WP4035-(1-9) were digested for ICP analysis on 09/24/99 (QC Batch PI24ICW1) in accordance with USEPA Method 3010A. Katahdin Sample No. WP4035-3 was prepared with duplicate matrix-spiked aliquots during digestion.

Soil-matrix Katahdin Sample Nos. WP4035-(11-13) were digested for ICP analysis on 10/01/99 (QC Batch PJ01ICS0) in accordance with USEPA Method 3050B. The measured calcium (16.3 mg/kg) and sodium (11.5 mg/kg) concentrations of the preparation blank that is associated with this QC batch exceed the laboratory's acceptance limits. However, because the measured calcium and sodium concentrations of all associated samples are more than ten times those of the preparation blank, no corrective action was required.

ICP analyses of Katahdin Work Order WP4035 sample digestates were performed in accordance with USEPA Method 6010B, using a Thermo Jarrell Ash (TJA) Trace ICP spectrometer and a TJA 61 ICP spectrometer. All samples were analyzed within holding times and all QC criteria were met with the following comments or exceptions:

Some of the results for run QC samples (ICV, ICB, CCV, CCB, ICSA, and ICSAB) included in the accompanying data package may have exceeded acceptance limits for some elements. Please note that all client samples and batch QC samples associated with out-of-control results for run QC samples were subsequently reanalyzed for the analytes in question.

Analysis of Mercury by Cold Vapor Atomic Absorption (CVAA) Spectrophotometry

Aqueous-matrix Katahdin Sample Nos. WP4035-(1, 2, 3, 9) were digested for mercury analysis on 09/25/99 (QC Batch PI25HGW0) in accordance with USEPA Method 7470A.

Soil-matrix Katahdin Sample Nos. WP4035-(11-13) were digested for mercury analysis on 10/07/99 (QC Batch PJ07HGS1) in accordance with USEPA Method 7471A. Katahdin Sample No. WP4035-11 was prepared with duplicate matrix-spiked aliquots.

Mercury analyses of Katahdin Work Order WP4035 sample digestates were performed using a Leeman Labs PS200 automated mercury analyzer. All samples were analyzed within holding times and all run QC criteria were met.

Wet Chemistry Analysis

Due to IC instrument failure, alternate methods were approved for work order WP3906 by Kelly Johnson-Carper for the analysis of nitrate and sulfate. Nitrate analyses (353.2) and Sulfate analyses (375.4) were performed according to the U.S. EPA, Methods for Chemical Analysis of Water and Wastes, EPA 600/4-79-020, 1979, Revised 1983. Sulfate analyses (E300) were performed according to the U.S. EPA "Methods for the Determination of Inorganic Substances in Environmental Samples", EPA 600/R-93/100, August 1993. Analyses for Solids-Total Residue (TS) have been performed in accordance with "Contract Laboratory Program Statement of Work for Inorganic Analysis".

All samples were analyzed within analytical hold times. No protocol deviations were noted by the Wet Chemistry laboratory staff.

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) #: WP4035
PAGE: 1 OF 3
COOLER: 1 OF 3
COC#: —
SDG#: —
DATE / TIME RECEIVED: 09-22-99 ~ 0930
DELIVERED BY: FEDEX
RECEIVED BY: BKR
LIMS ENTRY BY: BKR
LIMS REVIEW BY / PM: ADL

CLIENT: TETRATECH NUS

PROJECT: CTO 68

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☑	☐	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☑	☐	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 1.0	ADL notified Van Calligan by fax 9/22/99
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT Y or N?	☐	☑	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☑	☐	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	☐	☑	☐		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP NFESC ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]:
→ ID 25GLXC401 → Pb only container → pH > 2.0
→ Adj. pH to pH ≤ 2.0

0000104

[1] Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative added.

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) # WP4035

PAGE: 2 OF 3

COOLER: 2 OF 3

CLIENT: T-TECH NUS

PROJECT: CTO 68

COC# —
SDG# —
DATE / TIME RECEIVED: 09-22-99 ~ 0930
DELIVERED BY: FEDEX
RECEIVED BY: BKR
LIMS ENTRY BY: BKR
LIMS REVIEW BY / PM: ARL

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2.CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☐	☑	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☑	☐	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 0.6	AJC notified Dave Calligan Fax 9/22/99
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT Y or N?	☐	☑	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☐	☑	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	☑	☐	☐		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP NFESC ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]:

S010000

(1) Use this s (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if re d. If samples required pH adjustment, record volume and type of preservative added.

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) #: WP 4035
PAGE: 3 OF 3
COOLER: 3 OF 3
COC#: –
SDG#: –
DATE / TIME RECEIVED: 09-22-99~0930
DELIVERED BY: FEDEX
RECEIVED BY: BKR
LIMS ENTRY BY: BKK
LIMS REVIEW BY / PM: AJC

CLIENT: T-TECH NUS

PROJECT: CTO 68

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☐	☑	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☑	☐	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 0.6	AJC notified Dave Calligan by fax 9/22/99
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT Y or N?	☐	☑	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐		
8. TRIP BLANK PRESENT IN THIS COOLER	☐	☑	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	☑	☐	☐		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP NFESC ACOE AFCEE OTHER (STATE OF ORIGIN): ______

0000106

LOG - IN NOTES[1]:

[1] Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative added.

Katahdin Analytical Services
P.O. Box 720
Westbrook, ME 04098
Tel: (207) 874-2400
Fax: (207) 775-4029

CHAIN of CUSTODY

PLEASE PRINT IN PEN

Page ____ of ____

Client: TETRA TECH NUS

Contact: PAUL CALLIGAN

Phone #: (850) 385-9899

Fax #: (   )

Address: 1401 OVEN PARK DR 102

City: TALLAHASSEE

State: FL

Zip Code: 323C

Purchase Order #:

Proj. Name / No.: 0219

Katahdin Quote #:

Bill (if different than above): 813458369319

Address:

Sampler (Print / Sign): Thomas Thompson / [signature]

Copies To:

LAB USE ONLY

WORK ORDER #: WP4035

KATAHDIN PROJECT MANAGER ____________

REMARKS: ____________

SHIPPING INFO: ☐ FED EX ☐ UPS ☐ CLIENT

AIRBILL NO: ____________

TEMP°C ________ ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

ANALYSIS AND CONTAINER TYPE PRESERVATIVES

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	BTEX, MTBE, EDB, Total Naphthalene (Filt. ☐Y☐N)	PAH (Filt. ☐Y☐N)	Metals (Filt. ☐Y☐N)	Dissolved Methane (Filt. ☐Y☐N)	Anion (Filt. ☐Y☐N)	Total Lead (Filt. ☐Y☐N)	(Filt. ☐Y☐N)	(Filt. ☐Y☐N)	(Filt. ☐Y☐N)	(Filt. ☐Y☐N)
	22GLMØ3Ø1	9-21-99/1137	GW	10	3	2	1	3	1					
	22GLMØ4Ø1	9-21-99/1149	GW	10	3	2	1	3	1					
	22GLMØ6Ø1	9-21-99/11Ø4	GW	10	3	2	1	3	1					
	22GLMØ3Ø1D	9-21-99/~~0000~~	GW	6	3	2	1							
	25GLMØ1Ø1	/12Ø5	GW	10	3	2		3	1	1				
	25GLMØ5Ø1	/17Ø5	GW	10	3	2		3	1	1				
	25GLMØ5Ø1D	/ —	GW	6	3	2				1				
	~~25GLMØ7Ø1~~	~~/~~	~~GW~~	~~10~~	~~3~~	~~2~~		~~3~~	~~1~~	~~1~~				
	25GLXØ2Ø1	/1615	GW	6	3	2				1				
	25GLXØ4Ø1	/121Ø	GW	6	3	2				1				
	25TLØØ2Ø1	9-21-99 —	~~GW~~	2	2			TRIP BLANK						
		/												
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		/												
		/												

COMMENTS—

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
[signature]	9-21-99 / 18Ø5	8134583693 19		09-22-99 / 0900	[signature]
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

Katahdin Analytical Services
P.O. Box 720
Westbrook, ME 04098
Tel: (207) 874-2400
Fax: (207) 775-4029

CHAIN of CUSTODY

PLEASE PRINT IN PEN

Client: Tetra Tech NUS
Contact: Paul Calligan
Phone #: (843) 554-4925
Fax #: ( )
Address: NH-21 Ave H
City: North Charleston
State: S.C.
Zip Code:
Purchase Order #:
Proj. Name / No.: Charleston Naval Complex
Katahdin Quote #:
Bill (if different than above):
Address:
Sampler (Print / Sign): Roger Franklin / Roger Franklin
Copies To:

LAB USE ONLY
WORK ORDER #: WP 4037
KATAHDIN PROJECT MANAGER:
REMARKS:
SHIPPING INFO: ☐ FED EX ☐ UPS ☐ CLIENT
AIRBILL NO:
TEMP°C ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

ANALYSIS AND CONTAINER TYPE PRESERVATIVES

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	BTEX Naphthalene (8260)	PAH (8270) Naphthalene	TAL Metals							FID Readings ppm
	Filt. ☐Y ☐N				Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N
	365LBØ2Ø4Ø5	9/21/99/1600	S	6	X	X	X							7
	365LBØ5Ø4Ø5	9/21/99/1120	S	6	X	X	X							23
	365LBØ3Ø4Ø5	9/21/99/1430	S	6	X	X	X							4
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COMMENTS

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
R. Franklin	9/21/99 1800	Fed-Ex 813458369319		09-22-99 0830	[signature]
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

ORDER NO WP-4035

Project Manager: Andrea J. Colby
ORDER DATE: 09/22/99
PHONE: 850/385-9899
FAX: 850/385- 60
DUE: 22 OCT
FAC.ID: CNC CHARLESTON

REPORT TO: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
FOSTER PLAZA 7, 661 ANDERSEN DR.
PITTSBURGH, PA 15220

PHONE: 412/921-7090
PO: N7912-P99264

PROJECT: CTO #68

SAMPLED BY: T.THOMPSON DELIVERED BY: FEDEX DISPOSE: AFTER 21 NOV

ITEM	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
1	WP4035-1	22GLM0301	21 SEP 1137	22 SEP	AQ
	WP4035-2	22GLM0401	21 SEP 1149		
	WP4035-3	22GLM0601	21 SEP 1104		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Target Analyte List Metals, Total		3	100.00	300.00
Nitrate as N	353.2	3	30.00	90.00
Sulfate	375.4	3	0.00	0.00
Volatile Organics by 8260B	SW8260	3	75.00	225.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	3	125.00	375.00
Methane Subcontract		3	95.00	285.00
TOTALS		3	425.00	1275.00

ITEM	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
2	WP4035-6	25GLM0501D	21 SEP	22 SEP	AQ
	WP4035-7	25GLX0201	21 SEP 1615		
	WP4035-8	25GLX0401	21 SEP 1210		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	3	75.00	225.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	3	125.00	375.00
Lead, Total	200.7/6010	3	20.00	60.00
TOTALS		3	220.00	660.00

LABORATORY ORDER CONTINUED ON PAGE 2

ORDER NO WP-4035

Project Manager: Andrea J. Colby
ORDER DATE: 09/22/99
PHONE: 850/385-9899
FAX: 850/385-9860
DUE: 22 OCT
FAC.ID: CNC CHARLESTON

REPORT TO: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
FOSTER PLAZA 7, 661 ANDERSEN DR.
PITTSBURGH, PA 15220

PHONE: 412/921-7090
PO: N7912-P99264
PROJECT: CTO #68

SAMPLED BY: T.THOMPSON DELIVERED BY: FEDEX DISPOSE: AFTER 21 NOV

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
3	WP4035-9	22GLM0301D	21 SEP 0000	22 SEP	AQ

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	1	75.00	75.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	1	125.00	125.00
Target Analyte List Metals, Total		1	100.00	100.00
TOTALS		1	300.00	300.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
4	WP4035-10	25TL00201	21 SEP	22 SEP	AQ

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	1	75.00	75.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
5	WP4035-11	36SLB020405	21 SEP 1600	22 SEP	SL
	WP4035-12	36SLB050405	21 SEP 1120		
	WP4035-13	36SLB030405	21 SEP 1430		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	3	85.00	255.00
Solids-Total Residue (TS)	CLP/CIP SO	3	0.00	0.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	3	135.00	405.00
Target Analyte List Metals, Total		3	100.00	300.00
TPH Subcontract		3	75.00	225.00
TOTALS		3	395.00	1185.00

LABORATORY ORDER CONTINUED ON PAGE 3

092299

ORDER NO WP-4035

Project Manager: Andrea J. Colby
ORDER DATE: 09/22/99
PHONE: 850/385-9899
FAX: 850/385-9[illegible]
DUE: 22 OCT
FAC.ID: CNC CHARLESTON

REPORT TO: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
FOSTER PLAZA 7, 661 ANDERSEN DR.
PITTSBURGH, PA 15220

PHONE: 412/921-7090
PO: N7912-P99264
PROJECT: CTO #68

SAMPLED BY: T.THOMPSON DELIVERED BY: FEDEX DISPOSE: AFTER 21 NOV

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
6	WP4035-4	25GLM0101	21 SEP 1205	22 SEP	AQ
	WP4035-5	25GLM0501	21 SEP 1705		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	2	75.00	150.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	2	125.00	250.00
Methane Subcontract		2	95.00	190.00
Nitrate as N	353.2	2	30.00	60.00
Sulfate	375.4	2	0.00	0.00
Lead, Total	200.7/6010	2	20.00	40.00
TOTALS		2	345.00	690.00

ORDER NOTE: QC-II+ W/NARRATIVE
DD(KAS007QC-DB3)
CNC CHARLESTON
REPORT COPY: MS. LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.
PITTSBURGH,PA 15220
REPORT & DISK

INVOICE: With Report

TOTAL ORDER AMOUNT $4,185.00
This is NOT an Invo:

AJC/BKR/WEST.AJC(dw)
09-29Please contact KATAHDIN ANALYTICAL SERVICES promptly if you have any questi

KATAHDIN ANALYTICAL SERVICES
Summary of Report Notes

Report Note	Note Text
#	'#' flag denotes surrogate compound recovery is out of criteria.
B	'B' flag denotes detection of this analyte in the laboratory method blank analyzed concurrently with the sample.
E	'E' flag indicates an estimated value. The analyte was detected in the sample at a concentration greater than the standard calibration range.
J	'J' flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.
O-2	Sample dilution required for quantitation of one or more target analytes; therefore, standard laboratory Practical Quantitation Level (PQL) could not be achieved.

KATAHDIN ANALYTICAL SERVICES

Summary of Report Notes

Report Note	Note Text
A-1	Insufficient sample was provided to enable laboratory to achieve the laboratory's standard Practical Quantitation Level.
DL	'DL' flag denotes inability to calculate surrogate recovery due to sample dilution.
E	'E' flag indicates an estimated value. The analyte was detected in the sample at a concentration greater than the standard calibration range.
J	'J' flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.
O-13	Internal standard area(s) are out of criteria. Reanalysis confirmedmatrix interference.
O-2	Sample dilution required for quantitation of one or more target analytes; therefore, standard laboratory Practical Quantitation Level (PQL) could not be achieved.

INORGANIC ANALYSIS DATA SHEET

Lab Name: Katahdin Analytical Services | **Client Field ID:** 25GLM0101
Matrix: WATER | **SDG Name:** WP4035
Percent Solids: 0.00 | **Lab Sample ID:** WP4035-004

Concentration Units (ug/L or mg/Kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	DF
7439-92-1	LEAD	3.9	B		P	1

Comments:

Katahdin
ANALYTICAL SERVICES

Lab Number : WP-4035-4
Report Date: 10/20/99
PO No. : N7912-P99264
Project : CTO #68

CLIENT: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
25GLM0101	Aqueous	T.THOMPSON	09/21/99	09/22/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Nitrate as N	0.29	mg/L	1.0	0.050	353.2	09/23/99	KW	
Sulfate	160.	mg/L	10	1.0	300.0	09/24/99	CF	

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

10/20/99

LJO/ejnajc(dw)/bad/msm
PI23NOW1
CC: MS. LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client:	Paul Calligan Tetra Tech NUS 1401 Oven Park Dr. Suite 102 Tallahassee, FL 32308	**Lab Number:**	WP4035-4
		SDG:	WP4035
		Report Date:	10/7/99
		PO No. :	N7912-P99264
		Project:	CTO #68
Proj. ID:	CNC CHARLESTON	**% Solids:**	N/A
		Method:	EPA 8270
		Date Analyzed:	9/30/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25GLM0101	AQ	9/21/99	9/22/99	9/23/99	LAP	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<10	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	64	%	1.0		
2-FLUOROBIPHENYL	72	%	1.0		
TERPHENYL-D14	97	%	1.0		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client:	Paul Calligan Tetra Tech NUS 1401 Oven Park Dr. Suite 102 Tallahassee, FL 32308	**Lab Number:**	WP4035-4
		SDG:	WP4035
		Report Date:	10/6/99
		PO No. :	N7912-P99264
		Project:	CTO #68
Proj. ID:	CNC CHARLESTON	**% Solids:**	N/A
		Method:	SW8260
		Date Analyzed:	9/22/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25GLM0101	AQ	9/21/99	9/22/99	9/22/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	96	%	1.0		
1,2-DICHLOROETHANE-D4	101	%	1.0		
TOLUENE-D8	98	%	1.0		
P-BROMOFLUOROBENZENE	106	%	1.0		

Report Notes:

INORGANIC ANALYSIS DATA SHEET

Lab Name: Katahdin Analytical Services **Client Field ID:** 25GLM0501

Matrix: WATER **SDG Name:** WP4035

Percent Solids: 0.00 **Lab Sample ID:** WP4035-005

Concentration Units (ug/L or mg/Kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	DF
7439-92-1	LEAD	7.3			P	1

Comments:

FORM I - IN

Katahdin
ANALYTICAL SERVICES

Lab Number	: WP-4035-5
Report Date:	10/20/99
PO No.	: N7912-P99264
Project	: CTO #68

CLIENT: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
25GLM0501	Aqueous	T.THOMPSON	09/21/99	09/22/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Nitrate as N	<0.050	mg/L	1.0	0.050	353.2	09/23/99	KW	
Sulfate	40.	mg/L	10	1.0	300.0	09/24/99	CF	

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

10/20/99

LJO/ejnajc(dw)/bad/msm
PI23NOW1
CC: MS. LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client:	Paul Calligan Tetra Tech NUS 1401 Oven Park Dr. Suite 102 Tallahassee, FL 32308	**Lab Number:**	WP4035-5
		SDG:	WP4035
		Report Date:	10/7/99
		PO No. :	N7912-P99264
		Project:	CTO #68
Proj. ID:	CNC CHARLESTON	**% Solids:**	N/A
		Method:	EPA 8270
		Date Analyzed:	9/30/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25GLM0501	AQ	9/21/99	9/22/99	9/23/99	LAP	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	E280	ug/L	1.1	10	10
2-METHYLNAPHTHALENE	100	ug/L	1.1	10	10
ACENAPHTHYLENE	<10	ug/L	1.1	10	10
ACENAPHTHENE	<10	ug/L	1.1	10	10
FLUORENE	<10	ug/L	1.1	10	10
PHENANTHRENE	<10	ug/L	1.1	10	10
ANTHRACENE	<10	ug/L	1.1	10	10
FLUORANTHENE	<10	ug/L	1.1	10	10
PYRENE	<10	ug/L	1.1	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.1	10	10
CHRYSENE	<10	ug/L	1.1	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.1	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.1	10	10
BENZO[A]PYRENE	<10	ug/L	1.1	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.1	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.1	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.1	10	10
NITROBENZENE-D5	60	%	1.1		
2-FLUOROBIPHENYL	100	%	1.1		
TERPHENYL-D14	79	%	1.1		

Report Notes: E, A-1

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP4035-5DL
SDG: WP4035
Report Date: 10/7/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 10/1/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25GLM0501	AQ	9/21/99	9/22/99	9/23/99	LAP	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	480	ug/L	4.2	42	10
2-METHYLNAPHTHALENE	160	ug/L	4.2	42	10
ACENAPHTHYLENE	<42	ug/L	4.2	42	10
ACENAPHTHENE	<42	ug/L	4.2	42	10
FLUORENE	<42	ug/L	4.2	42	10
PHENANTHRENE	<42	ug/L	4.2	42	10
ANTHRACENE	<42	ug/L	4.2	42	10
FLUORANTHENE	<42	ug/L	4.2	42	10
PYRENE	<42	ug/L	4.2	42	10
BENZO[A]ANTHRACENE	<42	ug/L	4.2	42	10
CHRYSENE	<42	ug/L	4.2	42	10
BENZO[B]FLUORANTHENE	<42	ug/L	4.2	42	10
BENZO[K]FLUORANTHENE	<42	ug/L	4.2	42	10
BENZO[A]PYRENE	<42	ug/L	4.2	42	10
INDENO[1,2,3-CD]PYRENE	<42	ug/L	4.2	42	10
DIBENZ[A,H]ANTHRACENE	<42	ug/L	4.2	42	10
BENZO[G,H,I]PERYLENE	<42	ug/L	4.2	42	10
NITROBENZENE-D5	DL	%	4.2		
2-FLUOROBIPHENYL	DL	%	4.2		
TERPHENYL-D14	DL	%	4.2		

Report Notes: O-2, DL

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client:	Paul Calligan Tetra Tech NUS 1401 Oven Park Dr. Suite 102 Tallahassee, FL 32308	**Lab Number:**	WP4035-5
		SDG:	WP4035
		Report Date:	10/6/99
		PO No. :	N7912-P99264
		Project:	CTO #68
Proj. ID:	CNC CHARLESTON	**% Solids:**	N/A
		Method:	SW8260
		Date Analyzed:	9/23/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25GLM0501	AQ	9/21/99	9/22/99	9/23/99	HMP	5030	HMP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	E27000	ug/L	50	250	5
TOLUENE	E30000	ug/L	50	250	5
1,2-DIBROMOETHANE	<250	ug/L	50	250	5
ETHYLBENZENE	4300	ug/L	50	250	5
NAPHTHALENE	660	ug/L	50	250	5
MTBE	E23000	ug/L	50	250	5
TOTAL XYLENES	14000	ug/L	50	250	5
DIBROMOFLUOROMETHANE	83	%	50		
1,2-DICHLOROETHANE-D4	#64	%	50		
TOLUENE-D8	98	%	50		
P-BROMOFLUOROBENZENE	100	%	50		

Report Notes: E, #, O-2

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client:	Paul Calligan Tetra Tech NUS 1401 Oven Park Dr. Suite 102 Tallahassee, FL 32308	**Lab Number:**	WP4035-5DL
		SDG:	WP4035
		Report Date:	10/6/99
		PO No. :	N7912-P99264
		Project:	CTO #68
Proj. ID:	CNC CHARLESTON	**% Solids:**	N/A
		Method:	SW8260
		Date Analyzed:	9/24/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25GLM0501	AQ	9/21/99	9/22/99	9/24/99	KMC	5030	KMC

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	25000	ug/L	200	1000	5
TOLUENE	35000	ug/L	200	1000	5
1,2-DIBROMOETHANE	<1000	ug/L	200	1000	5
ETHYLBENZENE	3000	ug/L	200	1000	5
NAPHTHALENE	J700	ug/L	200	1000	5
MTBE	33000	ug/L	200	1000	5
TOTAL XYLENES	12000	ug/L	200	1000	5
DIBROMOFLUOROMETHANE	105	%	200		
1,2-DICHLOROETHANE-D4	111	%	200		
TOLUENE-D8	102	%	200		
P-BROMOFLUOROBENZENE	100	%	200		

Report Notes: J, O-2

INORGANIC ANALYSIS DATA SHEET

Lab Name: Katahdin Analytical Services **Client Field ID:** 25GLM0501D

Matrix: WATER **SDG Name:** WP4035

Percent Solids: 0.00 **Lab Sample ID:** WP4035-006

Concentration Units (ug/L or mg/Kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	DF
7439-92-1	LEAD	7.0			P	1

Comments:

FORM I - IN

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP4035-6
SDG: WP4035
Report Date: 10/7/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 9/30/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25GLM0501D	AQ	9/21/99	9/22/99	9/23/99	LAP	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	E220	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	68	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	48	%	1.0		
2-FLUOROBIPHENYL	73	%	1.0		
TERPHENYL-D14	61	%	1.0		

Report Notes: E

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client:	Paul Calligan Tetra Tech NUS 1401 Oven Park Dr. Suite 102 Tallahassee, FL 32308	**Lab Number:**	WP4035-6DL
		SDG:	WP4035
		Report Date:	10/7/99
		PO No. :	N7912-P99264
		Project:	CTO #68
Proj. ID:	CNC CHARLESTON	**% Solids:**	N/A
		Method:	EPA 8270
		Date Analyzed:	10/1/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25GLM0501D	AQ	9/21/99	9/22/99	9/23/99	LAP	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	470	ug/L	4.0	40	10
2-METHYLNAPHTHALENE	170	ug/L	4.0	40	10
ACENAPHTHYLENE	<40	ug/L	4.0	40	10
ACENAPHTHENE	<40	ug/L	4.0	40	10
FLUORENE	<40	ug/L	4.0	40	10
PHENANTHRENE	<40	ug/L	4.0	40	10
ANTHRACENE	<40	ug/L	4.0	40	10
FLUORANTHENE	<40	ug/L	4.0	40	10
PYRENE	<40	ug/L	4.0	40	10
BENZO[A]ANTHRACENE	<40	ug/L	4.0	40	10
CHRYSENE	<40	ug/L	4.0	40	10
BENZO[B]FLUORANTHENE	<40	ug/L	4.0	40	10
BENZO[K]FLUORANTHENE	<40	ug/L	4.0	40	10
BENZO[A]PYRENE	<40	ug/L	4.0	40	10
INDENO[1,2,3-CD]PYRENE	<40	ug/L	4.0	40	10
DIBENZ[A,H]ANTHRACENE	<40	ug/L	4.0	40	10
BENZO[G,H,I]PERYLENE	<40	ug/L	4.0	40	10
NITROBENZENE-D5	DL	%	4.0		
2-FLUOROBIPHENYL	DL	%	4.0		
TERPHENYL-D14	DL	%	4.0		

Report Notes: O-2, DL

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client:	Paul Calligan Tetra Tech NUS 1401 Oven Park Dr. Suite 102 Tallahassee, FL 32308	**Lab Number:**	WP4035-6
		SDG:	WP4035
		Report Date:	10/6/99
		PO No. :	N7912-P99264
		Project:	CTO #68
Proj. ID:	CNC CHARLESTON	**% Solids:**	N/A
		Method:	SW8260
		Date Analyzed:	9/23/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25GLM0501D	AQ	9/21/99	9/22/99	9/23/99	HMP	5030	HMP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	E26000	ug/L	50	250	5
TOLUENE	E31000	ug/L	50	250	5
1,2-DIBROMOETHANE	<250	ug/L	50	250	5
ETHYLBENZENE	4300	ug/L	50	250	5
NAPHTHALENE	780	ug/L	50	250	5
MTBE	E23000	ug/L	50	250	5
TOTAL XYLENES	15000	ug/L	50	250	5
DIBROMOFLUOROMETHANE	82	%	50		
1,2-DICHLOROETHANE-D4	#63	%	50		
TOLUENE-D8	97	%	50		
P-BROMOFLUOROBENZENE	101	%	50		

Report Notes: E, #, O-2

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP4035-6DL
SDG: WP4035
Report Date: 10/6/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 9/24/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25GLM0501D	AQ	9/21/99	9/22/99	9/24/99	KMC	5030	KMC

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	26000	ug/L	200	1000	5
TOLUENE	38000	ug/L	200	1000	5
1,2-DIBROMOETHANE	<1000	ug/L	200	1000	5
ETHYLBENZENE	3200	ug/L	200	1000	5
NAPHTHALENE	J760	ug/L	200	1000	5
MTBE	33000	ug/L	200	1000	5
TOTAL XYLENES	13000	ug/L	200	1000	5
DIBROMOFLUOROMETHANE	103	%	200		
1,2-DICHLOROETHANE-D4	108	%	200		
TOLUENE-D8	103	%	200		
P-BROMOFLUOROBENZENE	100	%	200		

Report Notes: J, O-2

INORGANIC ANALYSIS DATA SHEET

Lab Name: Katahdin Analytical Services | **Client Field ID:** 25GLX0201

Matrix: WATER | **SDG Name:** WP4035

Percent Solids: 0.00 | **Lab Sample ID:** WP4035-007

Concentration Units (ug/L or mg/Kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	DF
7439-92-1	LEAD	1.6	B		P	1

Comments:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP4035-7
SDG: WP4035
Report Date: 10/7/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 9/30/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25GLX0201	AQ	9/21/99	9/22/99	9/23/99	LAP	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<10	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	46	%	1.0		
2-FLUOROBIPHENYL	56	%	1.0		
TERPHENYL-D14	61	%	1.0		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client:	Paul Calligan Tetra Tech NUS 1401 Oven Park Dr. Suite 102 Tallahassee, FL 32308	**Lab Number:**	WP4035-7
		SDG:	WP4035
		Report Date:	10/6/99
		PO No. :	N7912-P99264
		Project:	CTO #68
Proj. ID:	CNC CHARLESTON	**% Solids:**	N/A
		Method:	SW8260
		Date Analyzed:	9/23/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25GLX0201	AQ	9/21/99	9/22/99	9/23/99	HMP	5030	HMP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	83	%	1.0		
1,2-DICHLOROETHANE-D4	73	%	1.0		
TOLUENE-D8	93	%	1.0		
P-BROMOFLUOROBENZENE	92	%	1.0		

Report Notes:

PREPARATION BLANKS

Lab Name: Katahdin Analytical Services

Sample ID: PBWPI24ICW1

Matrix: WATER

SDG Name: WP4035

QC Batch ID: PI24ICW1

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	RESULT	C
ALUMINUM	19.080	B
ANTIMONY	1.810	U
ARSENIC	2.070	U
BARIUM	1.810	B
BERYLLIUM	0.330	U
CADMIUM	1.940	U
CALCIUM	27.640	B
CHROMIUM	4.310	U
COBALT	4.450	U
COPPER	1.620	U
IRON	8.920	B
LEAD	1.090	U
MAGNESIUM	17.160	U
MANGANESE	0.970	U
NICKEL	13.210	U
POTASSIUM	449.540	U
SELENIUM	2.570	U
SILVER	2.540	U
SODIUM	84.140	B
THALLIUM	4.490	U
VANADIUM	3.580	U
ZINC	5.190	B

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP4035-8
SDG: WP4035
Report Date: 10/7/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: EPA 8270
Date Analyzed: 10/1/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25GLX0401	AQ	9/21/99	9/22/99	9/23/99	LAP	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<12	ug/L	1.2	12	10
2-METHYLNAPHTHALENE	<12	ug/L	1.2	12	10
ACENAPHTHYLENE	<12	ug/L	1.2	12	10
ACENAPHTHENE	<12	ug/L	1.2	12	10
FLUORENE	<12	ug/L	1.2	12	10
PHENANTHRENE	<12	ug/L	1.2	12	10
ANTHRACENE	<12	ug/L	1.2	12	10
FLUORANTHENE	<12	ug/L	1.2	12	10
PYRENE	<12	ug/L	1.2	12	10
BENZO[A]ANTHRACENE	<12	ug/L	1.2	12	10
CHRYSENE	<12	ug/L	1.2	12	10
BENZO[B]FLUORANTHENE	<12	ug/L	1.2	12	10
BENZO[K]FLUORANTHENE	<12	ug/L	1.2	12	10
BENZO[A]PYRENE	<12	ug/L	1.2	12	10
INDENO[1,2,3-CD]PYRENE	<12	ug/L	1.2	12	10
DIBENZ[A,H]ANTHRACENE	<12	ug/L	1.2	12	10
BENZO[G,H,I]PERYLENE	<12	ug/L	1.2	12	10
NITROBENZENE-D5	54	%	1.2		
2-FLUOROBIPHENYL	64	%	1.2		
TERPHENYL-D14	74	%	1.2		

Report Notes: A-1

Katahdin ANALYTICAL SERVICES

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP4035-8
SDG: WP4035
Report Date: 10/6/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 9/23/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25GLX0401	AQ	9/21/99	9/22/99	9/23/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	130	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	88	%	1.0		
1,2-DICHLOROETHANE-D4	87	%	1.0		
TOLUENE-D8	96	%	1.0		
P-BROMOFLUOROBENZENE	101	%	1.0		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client:	Paul Calligan Tetra Tech NUS 1401 Oven Park Dr. Suite 102 Tallahassee, FL 32308	**Lab Number:**	WP4035-10
		SDG:	WP4035
		Report Date:	10/6/99
		PO No. :	N7912-P99264
		Project:	CTO #68
Proj. ID:	CNC CHARLESTON	**% Solids:**	N/A
		Method:	SW8260
		Date Analyzed:	9/23/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25TL00201	AQ	9/21/99	9/22/99	9/23/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	88	%	1.0		
1,2-DICHLOROETHANE-D4	84	%	1.0		
TOLUENE-D8	96	%	1.0		
P-BROMOFLUOROBENZENE	99	%	1.0		

Report Notes:

3P

PREPARATION BLANKS

Lab Name: Katahdin Analytical Services **Sample ID:** PBSPJ01ICS0

Matrix: SOIL **SDG Name:** WP4035

QC Batch ID: PJ01ICS0

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

Analyte	RESULT	C
ALUMINUM	9.223	B
ANTIMONY	-0.205	B
ARSENIC	0.210	U
BARIUM	0.061	B
BERYLLIUM	0.020	U
CADMIUM	0.190	U
CALCIUM	16.324	
CHROMIUM	0.407	B
COBALT	0.060	U
COPPER	0.060	U
IRON	0.669	B
LEAD	0.110	U
MAGNESIUM	1.770	B
MANGANESE	0.053	B
NICKEL	1.320	U
POTASSIUM	44.950	U
SELENIUM	0.260	U
SILVER	0.070	U
SODIUM	11.547	
THALLIUM	0.450	U
VANADIUM	0.060	U
ZINC	0.153	B

LABORATORY CONTROL SAMPLES

Lab Name: Katahdin Analytical Services **Sample ID:** LCSSPJ01ICS0

Matrix: SOIL **SDG Name:** WP4035

QC Batch ID: PJ01ICS0

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

Analyte	TRUE	FOUND	% R	LIMITS (%)	
ALUMINUM	5720.0	5284.82	92.4	66	134
ANTIMONY	26.6	30.85	116.0	13	186
ARSENIC	163.0	179.02	109.8	62	138
BARIUM	195.0	246.23	126.3	66	134
BERYLLIUM	78.9	86.75	109.9	72	128
CADMIUM	114.0	115.92	101.7	74	124
CALCIUM	1280.0	1286.99	100.5	70	130
CHROMIUM	175.0	202.59	115.8	69	131
COBALT	73.7	83.62	113.5	70	130
COPPER	91.0	95.87	105.4	71	128
IRON	9080.0	8892.45	97.9	53	146
LEAD	66.0	83.22	126.1	68	132
MAGNESIUM	1210.0	1178.63	97.4	73	126
MANGANESE	261.0	289.32	110.9	78	122
NICKEL	68.3	75.55	110.6	56	144
POTASSIUM	1500.0	1373.71	91.6	64	136
SELENIUM	123.0	123.79	100.6	74	126
SILVER	57.2	53.95	94.3	71	128
SODIUM	1380.0	1402.75	101.6	68	133
THALLIUM	80.0	99.81	124.8	57	142
VANADIUM	95.4	108.52	113.8	68	132
ZINC	190.0	210.74	110.9	76	124

PREPARATION BLANKS

Lab Name: **Katahdin Analytical Services**

Sample ID: PBSPJ07HGS1

Matrix: SOIL

SDG Name: WP4035

QC Batch ID: PJ07HGS1

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

Analyte	RESULT	C
MERCURY	0.010	U

LABORATORY CONTROL SAMPLES

Lab Name: Katahdin Analytical Services **Sample ID:** LCSSPJ07HGS1

Matrix: SOIL **SDG Name:** WP4035

QC Batch ID: PJ07HGS1

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

Analyte	TRUE	FOUND	% R	LIMITS (%)	
MERCURY	1.8	2.32	128.9	54	146

PREPARATION BLANKS

Lab Name: Katahdin Analytical Services

Sample ID: PBWPI24ICW1

Matrix: WATER

SDG Name: WP4035

QC Batch ID: PI24ICW1

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	RESULT	C
ALUMINUM	19.080	B
ANTIMONY	1.810	U
ARSENIC	2.070	U
BARIUM	1.810	B
BERYLLIUM	0.330	U
CADMIUM	1.940	U
CALCIUM	27.640	B
CHROMIUM	4.310	U
COBALT	4.450	U
COPPER	1.620	U
IRON	8.920	B
LEAD	1.090	U
MAGNESIUM	17.160	U
MANGANESE	0.970	U
NICKEL	13.210	U
POTASSIUM	449.540	U
SELENIUM	2.570	U
SILVER	2.540	U
SODIUM	84.140	B
THALLIUM	4.490	U
VANADIUM	3.580	U
ZINC	5.190	B

LABORATORY CONTROL SAMPLES

Lab Name: Katahdin Analytical Services **Sample ID:** LCSWPI24ICW1

Matrix: WATER **SDG Name:** WP4035

QC Batch ID: PI24ICW1

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	TRUE	FOUND	% R	LIMITS (%)	
ALUMINUM	2000.0	1957.03	97.9	80	120
ANTIMONY	500.0	501.39	100.3	80	120
ARSENIC	2000.0	1935.06	96.8	80	120
BARIUM	2000.0	2102.62	105.1	80	120
BERYLLIUM	50.0	52.87	105.7	80	120
CADMIUM	50.0	53.05	106.1	80	120
CALCIUM	2500.0	2678.37	107.1	80	120
CHROMIUM	200.0	212.83	106.4	80	120
COBALT	500.0	527.54	105.5	80	120
COPPER	250.0	248.67	99.5	80	120
IRON	1000.0	1070.93	107.1	80	120
LEAD	500.0	550.63	110.1	80	120
MAGNESIUM	5000.0	4828.88	96.6	80	120
MANGANESE	500.0	527.50	105.5	80	120
NICKEL	500.0	539.85	108.0	80	120
POTASSIUM	25000.0	23749.69	95.0	80	120
SELENIUM	2000.0	1853.45	92.7	80	120
SILVER	50.0	43.11	86.2	80	120
SODIUM	7500.0	7501.04	100.0	80	120
THALLIUM	2000.0	2216.78	110.8	80	120
VANADIUM	500.0	524.53	104.9	80	120
ZINC	500.0	499.80	100.0	80	120

3P

PREPARATION BLANKS

Lab Name: Katahdin Analytical Services

Sample ID: PBWPI25HGW0

Matrix: WATER

SDG Name: WP4035

QC Batch ID: PI25HGW0

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	RESULT	C
MERCURY	0.020	U

FORM III (Part 2) - IN

LABORATORY CONTROL SAMPLES

Lab Name: Katahdin Analytical Services **Sample ID:** LCSWPI25HGW0

Matrix: WATER **SDG Name:** WP4035

QC Batch ID: PI25HGW0

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	TRUE	FOUND	% R	LIMITS (%)	
MERCURY	5.0	4.86	97.2	80	120

SPIKE SAMPLE RECOVERY

Lab Name: Katahdin Analytical Services
Matrix: WATER
Percent Solids: 0.00

Client Field ID: 22GLM0601S
SDG Name: WP4035
Lab Sample ID: WP4035-003S

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	Spiked Sample Result	C	Sample Result	C	Spike Added	%R	Q	Control Limits (%R) Low	High	M
ALUMINUM	2346.3500		136.5400		2000	110.5		75	125	P
ANTIMONY	545.4400		-1.4000	U	500	109.1		75	125	P
ARSENIC	2239.4800		6.0600	B	2000	111.7		75	125	P
BARIUM	2226.8100		65.3700		2000	108.1		75	125	P
BERYLLIUM	55.9100		0.2500	U	50	111.8		75	125	P
CADMIUM	59.5000		1.0800	U	50	119.0		75	125	P
CALCIUM	395830.5000		397131.8300		2500	-52.1		75	125	P
CHROMIUM	216.7400		-3.8000	U	200	108.4		75	125	P
COBALT	642.8200		102.4300		500	108.1		75	125	P
COPPER	269.6900		-0.9900	U	250	107.9		75	125	P
IRON	18672.9600		17767.2500		1000	90.6		75	125	P
LEAD	527.4600		1.3400	B	500	105.2		75	125	P
MAGNESIUM	152163.8000		147898.0800		5000	85.3		75	125	P
MANGANESE	6093.8900		5608.3500		500	97.1		75	125	P
NICKEL	588.7900		31.0100	B	500	111.6		75	125	P
POTASSIUM	41558.4200		14461.4900		25000	108.4		75	125	P
SELENIUM	2109.6200		0.2100	U	2000	105.5		75	125	P
SILVER	47.5900		-3.9200	U	50	95.2		75	125	P
SODIUM	1587538.3300		1600947.6300		7500	-178.8		75	125	P
THALLIUM	2070.8200		-0.3700	U	2000	103.5		75	125	P
VANADIUM	550.5300		-1.6200	U	500	110.1		75	125	P
ZINC	573.9200		29.1400		500	109.0		75	125	P

Comments:

5A

SPIKE SAMPLE RECOVERY

Lab Name: Katahdin Analytical Services

Matrix: WATER

Percent Solids: 0.00

Client Field ID: 22GLM0601S

SDG Name: WP4035

Lab Sample ID: WP4035-003P

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	Spiked Sample Result	C	Sample Result	C	Spike Added	%R	Q	Control Limits (%R) Low	High	M
ALUMINUM	2349.6500		136.5400		2000	110.7		75	125	P
ANTIMONY	546.4900		-1.4000	U	500	109.3		75	125	P
ARSENIC	2246.7500		6.0600	B	2000	112.0		75	125	P
BARIUM	2248.6000		65.3700		2000	109.2		75	125	P
BERYLLIUM	57.0300		0.2500	U	50	114.1		75	125	P
CADMIUM	61.1500		1.0800	U	50	122.3		75	125	P
CALCIUM	397133.0500		397131.8300		2500	0.0		75	125	P
CHROMIUM	217.6200		-3.8000	U	200	108.8		75	125	P
COBALT	652.8700		102.4300		500	110.1		75	125	P
COPPER	272.5500		-0.9900	U	250	109.0		75	125	P
IRON	19120.2600		17767.2500		1000	135.3		75	125	P
LEAD	521.9400		1.3400	B	500	104.1		75	125	P
MAGNESIUM	155943.0800		147898.0800		5000	160.9		75	125	P
MANGANESE	6243.1600		5608.3500		500	127.0		75	125	P
NICKEL	594.4000		31.0100	B	500	112.7		75	125	P
POTASSIUM	42151.4700		14461.4900		25000	110.8		75	125	P
SELENIUM	2112.5200		0.2100	U	2000	105.6		75	125	P
SILVER	47.9100		-3.9200	U	50	95.8		75	125	P
SODIUM	1639213.8600		1600947.6300		7500	510.2		75	125	P
THALLIUM	2059.0100		-0.3700	U	2000	103.0		75	125	P
VANADIUM	555.3900		-1.6200	U	500	111.1		75	125	P
ZINC	584.0600		29.1400		500	111.0		75	125	P

Comments:

5D

SPIKE DUPLICATES

Lab Name: Katahdin Analytical Services **Client Field ID:** 22GLM0601

Matrix: WATER **SDG Name:** WP4035

Percent Solids: 0.00 **Lab Sample ID:** WP4035-003

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	Control Limits	Spike Result	C	Spike Dup. Result	C	RPD	Q	M
ALUMINUM		2346.3500		2349.6500		0.1		P
ANTIMONY		545.4400		546.4900		0.2		P
ARSENIC		2239.4800		2246.7500		0.3		P
BARIUM		2226.8100		2248.6000		1.0		P
BERYLLIUM		55.9100		57.0300		2.0		P
CADMIUM		59.5000		61.1500		2.7		P
CALCIUM		395830.5000		397133.0500		0.3		P
CHROMIUM		216.7400		217.6200		0.4		P
COBALT		642.8200		652.8700		1.6		P
COPPER		269.6900		272.5500		1.1		P
IRON		18672.9600		19120.2600		2.4		P
LEAD		527.4600		521.9400		1.1		P
MAGNESIUM		152163.8000		155943.0800		2.5		P
MANGANESE		6093.8900		6243.1600		2.4		P
NICKEL		588.7900		594.4000		0.9		P
POTASSIUM		41558.4200		42151.4700		1.4		P
SELENIUM		2109.6200		2112.5200		0.1		P
SILVER	15	47.5900		47.9100		0.7		P
SODIUM		1587538.3300		1639213.8600		3.2		P
THALLIUM		2070.8200		2059.0100		0.6		P
VANADIUM		550.5300		555.3900		0.9		P
ZINC		573.9200		584.0600		1.8		P

Comments:

5A

SPIKE SAMPLE RECOVERY

Lab Name: Katahdin Analytical Services

Client Field ID: 36SLB020405S

Matrix: SOIL

SDG Name: WP4035

Percent Solids: 75.5

Lab Sample ID: WP4035-011S

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

Analyte	Spiked Sample Result	C	Sample Result	C	Spike Added	%R	Q	Control Limits (%R) Low	Control Limits (%R) High	M
MERCURY	0.3277		0.1696		0.18	87.8		75	125	CV

Comments:

SPIKE SAMPLE RECOVERY

Lab Name: Katahdin Analytical Services

Matrix: SOIL

Percent Solids: 75.5

Client Field ID: 36SLB020405S

SDG Name: WP4035

Lab Sample ID: WP4035-011P

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

Analyte	Spiked Sample Result	C	Sample Result	C	Spike Added	%R	Q	Control Limits (%R) Low	Control Limits (%R) High	M
MERCURY	0.3739		0.1696		0.18	113.5		75	125	CV

Comments:

SPIKE DUPLICATES

Lab Name: Katahdin Analytical Services

Matrix: SOIL

Percent Solids: 75.5

Client Field ID: 36SLB020405

SDG Name: WP4035

Lab Sample ID: WP4035-011

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

Analyte	Control Limits	Spike Result	C	Spike Dup. Result	C	RPD	Q	M
MERCURY		0.3277		0.3739		13.2		CV

Comments:

FORM VD - IN

Katahdin
ANALYTICAL SERVICES

CLIENT: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

PROJECT: CTO #68

REPORT OF LABORATORY METHOD BLANK RESULTS

SAMPLE DESCRIPTION					MATRIX
METHOD BLANK					Aqueous

ANALYTE	ANALYZED	UNITS	METHOD	RESULT	NOTES
Nitrate as N	09-23-99	mg/L	353.2	<0.050	

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values. See cover letter for additional information

10/19/99

Lab Number: WP4035-5

Katahdin ANALYTICAL SERVICES

CLIENT: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

PROJECT: CTO #68

REPORT OF LAB CONTROL SPIKE RESULTS

SAMPLE DESCRIPTION	MATRIX
LAB CONTROL SPIKE	Aqueous

ANALYTE	ANALYZED	UNITS	METHOD	SPK	SPK RES	% REC	LIMITS	NOTES
Nitrate as N	09-23-99	mg/L	353.2	1.00	0.906	91		

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values. See cover letter for additional information

10/19/99

Lab Number: WP4035-5

Katahdin
ANALYTICAL SERVICES

CLIENT: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

PROJECT: CTO #68

REPORT OF DUPLICATE SAMPLE RESULTS

SAMPLE DESCRIPTION	MATRIX
QC DUPLICATE	Aqueous

ANALYTE	ANALYZED	UNITS	METHOD	*PQL	RESULT	DUP #1	RPD	LIMITS	NOTES
Nitrate as N	09-23-99	mg/L	353.2	0.050	<0.050	<0.050	-0.00		

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values. See cover letter for additional information

10/19/99

Lab Number: WP4035-5

Katahdin
ANALYTICAL SERVICES

CLIENT: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

PROJECT: CTO #68

REPORT OF SAMPLE MATRIX SPIKE RESULTS

SAMPLE DESCRIPTION	MATRIX
QC SPIKE	Aqueous

ANALYTE	ANALYZED	UNITS	METHOD	SPK	RESULT	SPK RES	% REC	LIMITS	NOTES
Nitrate as N	09-23-99	mg/L	353.2	0.500	<0.050	0.397	79		

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values. See cover letter for additional information

10/19/99

Lab Number: WP4035-5

Katahdin
ANALYTICAL SERVICES

CLIENT: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

PROJECT: CTO #68

REPORT OF LABORATORY METHOD BLANK RESULTS

SAMPLE DESCRIPTION	MATRIX
METHOD BLANK	Aqueous

ANALYTE	ANALYZED	UNITS	METHOD	RESULT	NOTES
Sulfate	10-11-99	mg/L	375.4	<1.0	

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values. See cover letter for additional information

10/19/99

Lab Number: WP4035-1

Katahdin
ANALYTICAL SERVICES

CLIENT: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

PROJECT: CTO #68

REPORT OF LAB CONTROL SPIKE RESULTS

SAMPLE DESCRIPTION	MATRIX
LAB CONTROL SPIKE	Aqueous

ANALYTE	ANALYZED	UNITS	METHOD	SPK	SPK RES	% REC	LIMITS	NOTES
Sulfate	10-11-99	mg/L	375.4	250	221	88		

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values. See cover letter for additional information

10/19/99

Lab Number: WP4035-1

Katahdin
ANALYTICAL SERVICES

CLIENT: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

PROJECT: CTO #68

REPORT OF LABORATORY METHOD BLANK RESULTS

SAMPLE DESCRIPTION	MATRIX
METHOD BLANK	Aqueous

ANALYTE	ANALYZED	UNITS	METHOD	RESULT	NOTES
Sulfate	09-24-99	mg/L	300.0	<1.0	

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values. See cover letter for additional information

10/19/99

Lab Number: WP4035-4

CLIENT: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

PROJECT: CTO #68

REPORT OF LAB CONTROL SPIKE RESULTS

SAMPLE DESCRIPTION	MATRIX
LAB CONTROL SPIKE	Aqueous

ANALYTE	ANALYZED	UNITS	METHOD	SPK	SPK RES	% REC	LIMITS	NOTES
Sulfate	09-24-99	mg/L	300.0	10.0	9.90	99		

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values. See cover letter for additional information

10/19/99

Lab Number: WP4035-4

Katahdin
ANALYTICAL SERVICES

CLIENT: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

PROJECT: CTO #68

REPORT OF LABORATORY METHOD BLANK RESULTS

SAMPLE DESCRIPTION	MATRIX
METHOD BLANK	Solid/Soil/Sludge

ANALYTE	ANALYZED	UNITS	METHOD	RESULT	NOTES
Solids-Total Residue (TS)	09-28-99	wt %	CLP/CI	<0.10	1

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values. See cover letter for additional information
[1] Sample Preparation on 09-27-99 by JF

10/19/99

Lab Number: WP4035-11

CLIENT: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

PROJECT: CTO #68

REPORT OF LAB CONTROL SPIKE RESULTS

SAMPLE DESCRIPTION	MATRIX
LAB CONTROL SPIKE	Solid/Soil/Sludge

ANALYTE	ANALYZED	UNITS	METHOD	SPK	SPK RES	% REC	LIMITS	NOTES
Solids-Total Residue (TS)	09-28-99	wt %	CLP/CI	90	88.7	99		1

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values. See cover letter for additional information

[1] Sample Preparation on 09-27-99 by JF

10/19/99

Lab Number: WP4035-11

Katahdin
ANALYTICAL SERVICES

CLIENT: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

PROJECT: CTO #68

REPORT OF DUPLICATE SAMPLE RESULTS

SAMPLE DESCRIPTION	MATRIX
QC DUPLICATE	Solid/Soil/Sludge

ANALYTE	ANALYZED	UNITS	METHOD	*PQL	RESULT	DUP #1	RPD	LIMITS	NOTES
Solids-Total Residue (TS)	09-28-99	wt %	CLP/CI	0.10	75.	75.5	0.66		1

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values. See cover letter for additional information

[1] Sample Preparation on 09-27-99 by JF

10/19/99

Lab Number: WP4035-11

4B

SEMIVOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK;092399

Lab Name: Katahdin Analytical Services SDG No.: WP4035

Lab File ID: X2963 Lab Sample ID: SBLK;092399

Instrument ID: 5970-X Date Extracted: 9/23/99

GC Column: RTX-5 ID: 0.25 (mm) Date Analyzed: 09/30/99

Matrix: (soil/water) WATER Time Analyzed: 9:31

Level: (low/med) LOW

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S :

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCS;092399	LCS;092399	X2964	9/30/99	10:16:00 AM
LCSD;092399	LCSD;092399	X2965	9/30/99	11:00:00 AM
22GLM0401	WP4035-2	X2967	9/30/99	12:29:00 PM
22GLM0601	WP4035-3	X2968	9/30/99	1:14:00 PM
25GLM0101	WP4035-4	X2969	9/30/99	1:58:00 PM
25GLM0501	WP4035-5	X2970	9/30/99	2:43:00 PM
25GLM0501D	WP4035-6	X2971	9/30/99	3:28:00 PM
25GLX0201	WP4035-7	X2972	9/30/99	4:13:00 PM
22GLM0301D	WP4035-9	X2974	9/30/99	5:42:00 PM
22GLM0301	WP4035-1	X2975	9/30/99	6:26:00 PM
22GLM0601	WP4035-3RA	X2976	9/30/99	7:11:00 PM
25GLX0401	WP4035-8	X2982	10/1/99	1:03:00 PM
25GLM0501D	WP4035-6DL	X2986	10/1/99	4:01:00 PM
25GLM0501	WP4035-5DL	X2987	10/1/99	4:46:00 PM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client:	Paul Calligan Tetra Tech NUS 1401 Oven Park Dr. Suite 102 Tallahassee, FL 32308	**Lab Number:**	SBLK;092399
		SDG:	WP4035
		Report Date:	10/7/99
		PO No. :	N7912-P99264
		Project:	CTO #68
Proj. ID:	CNC CHARLESTON	**% Solids:**	N/A
		Method:	EPA 8270
		Date Analyzed:	9/30/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
SBLK;092399	AQ	-	-	9/23/99	LAP	EPA 3510	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<10	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
ACENAPHTHENE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
NITROBENZENE-D5	76	%	1.0		
2-FLUOROBIPHENYL	66	%	1.0		
TERPHENYL-D14	73	%	1.0		

Report Notes:

Katahdin Analytical Services

LCS/LCSD Report

Sample	File Name	Date Acquired	Time inj	Analyst	Matrix	Method
LCS;092399	X2964	9/30/99	10:16	KRT	AQ	8270
LCSD;092399	X2965	9/30/99	11:00	KRT	AQ	8270

Compound Name	Spk Amt ug/L	LCS Result ug/L	LCSD Result ug/L	LCS Rec (%)	LCSD Rec (%)	Rec. Limits (%)	RPD (%)	RPD Limit (%)
2-METHYLNAPHTHALENE	50	22.6	22.6	*45	*45	70-130	0	30
ACENAPHTHENE	50	29.3	34.9	*59	70	70-130	17	30
ACENAPHTHYLENE	50	27.3	33.5	*55	*67	70-130	20	30
ANTHRACENE	50	29.0	38.8	*58	78	70-130	29	30
BENZO[A]ANTHRACENE	50	28.8	33.4	*58	*67	70-130	14	30
BENZO[A]PYRENE	50	29.0	41.7	*58	83	70-130	*35	30
BENZO[B]FLUORANTHENE	50	30.5	45.3	*61	91	70-130	*39	30
BENZO[G,H,I]PERYLENE	50	27.3	38.6	*55	77	70-130	*33	30
BENZO[K]FLUORANTHENE	50	29.5	47.9	*59	96	70-130	*48	30
CHRYSENE	50	33.3	42.8	*67	86	70-130	25	30
DIBENZ[A,H]ANTHRACENE	50	27.1	39.2	*54	78	70-130	*36	30
FLUORANTHENE	50	31.6	44.4	*63	89	70-130	*34	30
FLUORENE	50	25.8	32.3	*52	*65	70-130	22	30
INDENO[1,2,3-CD]PYRENE	50	22.9	24.8	*46	*50	70-130	8.3	30
NAPHTHALENE	50	30.9	33.9	*62	*68	70-130	9.2	30
PHENANTHRENE	50	29.5	40.0	*59	80	70-130	30	30
PYRENE	50	35.9	46.2	72	92	70-130	24	30

RPD = (lcs rec - lcsd rec) /[(lcsd rec +lcsd rec)/2] * 100

* Out of Limits

VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKQ22B

Lab Name: Katahdin Analytical Services SDG No.: WP4035

Lab File ID: Q6709 Lab Sample ID: VBLKQ22B

Date Analyzed: 09/22/99 Time Analyzed: 18:34

GC Column: RTX-502 ID: 0.53 (mm) Heated Purge: (Y/N) N

Instrument ID: 5970-Q

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S :

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSQ22A	LCSQ22A	Q6707	9/22/99	5:07:00 PM
22GLM0301	WP4035-1	Q6712	9/22/99	8:34:00 PM
22GLM0401	WP4035-2	Q6713	9/22/99	9:12:00 PM
22GLM0601	WP4035-3	Q6714	9/22/99	9:49:00 PM
25GLM0101	WP4035-4	Q6715	9/22/99	10:27:00 PM
25GLX0401	WP4035-8	Q6719	9/23/99	1:02:00 AM
22GLM0301D	WP4035-9	Q6720	9/23/99	1:40:00 AM
25TL00201	WP4035-10	Q6721	9/23/99	2:19:00 AM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client:	Paul Calligan Tetra Tech NUS 1401 Oven Park Dr. Suite 102 Tallahassee, FL 32308	**Lab Number:**	VBLKQ22B
		SDG:	WP4035
		Report Date:	10/6/99
		PO No. :	N7912-P99264
		Project:	CTO #68
Proj. ID:	CNC CHARLESTON	**% Solids:**	N/A
		Method:	SW8260
		Date Analyzed:	9/22/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKQ22B	AQ	-	-	9/22/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	92	%	1.0		
1,2-DICHLOROETHANE-D4	84	%	1.0		
TOLUENE-D8	92	%	1.0		
P-BROMOFLUOROBENZENE	91	%	1.0		

Report Notes:

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: Q6707 **Sample ID:** LCSQ22A **Date Run:** 9/22/99

Analyst: JSS **Time Injected:** 5:07:00 PM **Matrix:** AQ

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	43.4	87	60-140
BENZENE	50	47.4	95	60-140
ETHYLBENZENE	50	53.3	106	60-140
MTBE	50	46.4	93	60-140
NAPHTHALENE	50	61.6	123	60-140
TOLUENE	50	44.2	88	60-140
TOTAL XYLENES	150	140	93	60-140

*** Out of Limits**

4A
VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKQ23A

Lab Name: Katahdin Analytical Services SDG No.: WP4035

Lab File ID: Q6724 Lab Sample ID: VBLKQ23A

Date Analyzed: 09/23/99 Time Analyzed: 10:57

GC Column: RTX-502 ID: 0.53 (mm) Heated Purge: (Y/N) N

Instrument ID: 5970-Q

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S :

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSQ23A	LCSQ23A	Q6723	9/23/99	10:03:00 AM
25GLX0201	WP4035-7	Q6726	9/23/99	1:41:00 PM
25GLM0501	WP4035-5	Q6731	9/23/99	4:51:00 PM
25GLM0501D	WP4035-6	Q6732	9/23/99	5:28:00 PM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Katahdin ANALYTICAL SERVICES

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: VBLKQ23A
SDG: WP4035
Report Date: 10/6/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 9/23/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKQ23A	AQ	-	-	9/23/99	HMP	5030	HMP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	86	%	1.0		
1,2-DICHLOROETHANE-D4	78	%	1.0		
TOLUENE-D8	97	%	1.0		
P-BROMOFLUOROBENZENE	97	%	1.0		

Report Notes:

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: Q6723 **Sample ID:** LCSQ23A **Date Run:** 9/23/99

Analyst: HMP **Time Injected:** 10:03:00 AM **Matrix:** AQ

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	54.6	109	60-140
BENZENE	50	50.7	101	60-140
ETHYLBENZENE	50	56.9	114	60-140
MTBE	50	58.6	117	60-140
NAPHTHALENE	50	54.7	109	60-140
TOLUENE	50	51.4	103	60-140
TOTAL XYLENES	150	157	105	60-140

*** Out of Limits**

4A

VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKU24A

Lab Name: Katahdin Analytical Services SDG No.: WP4035

Lab File ID: U1070 Lab Sample ID: VBLKU24A

Date Analyzed: 09/24/99 Time Analyzed: 9:12

GC Column: RTX-624 ID: 0.18 (mm) Heated Purge: (Y/N) N

Instrument ID: 5973-U

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S :

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSU24A	LCSU24A	U1069	9/24/99	8:28:00 AM
25GLM0501	WP4035-5DL	U1080	9/24/99	3:29:00 PM
25GLM0501D	WP4035-6DL	U1081	9/24/99	4:08:00 PM

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client:	Paul Calligan Tetra Tech NUS 1401 Oven Park Dr. Suite 102 Tallahassee, FL 32308	**Lab Number:**	VBLKU24A
		SDG:	WP4035
		Report Date:	10/6/99
		PO No. :	N7912-P99264
		Project:	CTO #68
Proj. ID:	CNC CHARLESTON	**% Solids:**	N/A
		Method:	SW8260
		Date Analyzed:	9/24/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKU24A	AQ	-	-	9/24/99	KMC	5030	KMC

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	102	%	1.0		
1,2-DICHLOROETHANE-D4	104	%	1.0		
TOLUENE-D8	101	%	1.0		
P-BROMOFLUOROBENZENE	98	%	1.0		

Report Notes:

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: U1069 **Sample ID:** LCSU24A **Date Run:** 9/24/99

Analyst: KMC **Time Injected:** 8:28:00 AM **Matrix:** AQ

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	54.9	110	60-140
BENZENE	50	52.0	104	60-140
ETHYLBENZENE	50	54.0	108	60-140
MTBE	50	49.7	99	60-140
NAPHTHALENE	50	55.4	111	60-140
TOLUENE	50	53.6	107	60-140
TOTAL XYLENES	150	159	106	60-140

*** Out of Limits** 1

ENSR
Air Toxics Specialty Laboratory
42 Nagog Park
Acton, MA 01720

DATE: October 12, 1999

TO: Andrea Colby
Katahdin Analytical
340 County Road No. 5
P.O. Box 720
Westbrook, ME 04098

Re: Organic Analyses of Aqueous Samples for Methane by Gas Chromatography/Flame Ionization Detection (GC/FID)- **WP4035**

PROJECT #: **8601-008-200**

LAB ID #: **990178**

ANALYTICAL PROCEDURE:

Five (5) aqueous samples were analyzed for methane under the guidelines of SW-846 Method 3810.

A Hewlett Packard 5890 series II gas chromatograph (GC) equipped with a Hewlett Packard flame ionization detector (FID) was used for the analysis. A 1.0 mL headspace aliquot of each sample was injected into the column for analysis. The operating conditions of the GC/FID are listed in Table 1. A five point calibration was performed for the target analyte, methane.

It should be noted that all samples were received at 10°C.

QUALITY CONTROL:

1. A laboratory blank was analyzed daily in the same manner as the samples. Methane was not detected in the blank.

2. MS/MSD analyses were performed on a sample from another Katahdin job (WP3906). The recoveries and relative percent differences of methane were within QC limits.

3. A laboratory control spike was analyzed daily. The recovery of methane was within the QC acceptance limits.

Date Samples Received by the Laboratory: 9/23/99

Date Analysis Started: 9/24/99

C:\My Documents\Kat 990175 990178 990180\katrpt4.doc

Katahdin ANALYTICAL SERVICES
340 County Road No. 5
P.O. Box 720
Westbrook, ME 04092
Tel: (207) 874-2400
Fax: (207) 775-4029

CHAIN of CUSTODY

990178

PLEASE PRINT IN PEN Page ____ of ____

Client	Contact	Phone #	Fax #
Katahdin Analytical Services	Andrea Colby	( )	( )

Address	City	State	Zip Code
as above			

Purchase Order # | Proj. Name / No. | Katahdin Quote #

Bill (if different than above) | Address

Sampler (Print / Sign) | Copies To:

LAB USE ONLY WORK ORDER #:

KATAHDIN PROJECT MANAGER

REMARKS: Sub to ENER

SHIPPING INFO: ☒ FED EX ☐ UPS ☐ CLIENT

AIRBILL NO:

TEMP°C ____ ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

ANALYSIS AND CONTAINER TYPE PRESERVATIVES (Filt. ☐Y ☐N)

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	Dissolved Metals									
	WP 4035-1	9-~~22~~ 21-99 / 1137	AQ	3	X	990178-1								
	WP 4035-2	/ 1149			X	-2								
	WP 4035-3	/ 1104			X	-3								
	WP 4035-4	/ 1205			X	-4								
	WP 4035-5	/ 1705			X	-5								
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COMMENTS
QC-II + w/Narrative DD (KAS007QC-DB3) Results Due: 10-20-99

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
[signature]	9-22-99 1550	[signature]			
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
		9/23/99 @ 1020			

FORMSOURCE INC. (207) 782-3311
FORM # CHN-OF-CSTDY

DUPLICATE

SAMPLE LOG-IN & RECEIPT CHECKLIST

Client/Proj #: Katahdin WP4035

Proj Mgr: M. Hoyt

Lab Pool #: 990178

Inspected & Logged in by: A. MacDuff

Date Time: 9/23/99 @1025

Sample Matrix	Number of Samples	Analysis Requested	Analyze by (date)	Storage Location
Aqueous	5	CH_4	10/7/99	R1

Circle the appropriate response:

1) Shipped Hand delivered

2) COC present / not present on receipt

3) COC Tape present / not present on shipping container

4) Samples broken / intact on receipt

5) Samples ambient / chilled on receipt Temp blank @ 10°C

6) Samples preserved correctly / incorrectly / none recommended

7) Received within / outside holding time

8) COC tapes present / not present on samples

9) Discrepancies / NO discrepancies noted between COCs and samples

Additional Comments: 3 VOAs per sample, no individual vial numbers

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
WP4035-4

Lab Name: ENSR Contract:

Lab Code: Case No.: SAS NO.: SDG NO.:

Matrix: (soil/water) water Lab Sample ID: 990178-4

Sample wt / vol: 32.5 ml (g/ml) Lab File ID: KAT_030

Level: (low/med) low Date Received: 9/23/99

% Moisture: NA Date Analyzed: 9/24/99

GC Column: Carboxen 1004 OD: 1/16" Dilution Factor: 1

Soil Extract Volume: NA (µl) Soil Aliquot Volume: NA (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) µg/L	Q
74-82-8	Methane	4400	E

25GLM0101

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

WP4035-4 D

Lab Name: ENSR Contract:

Lab Code: Case No.: SAS NO.: SDG NO.:

Matrix: (soil/water) water

Lab Sample ID: 990178-4 DIL

Sample wt / vol: 32.5 ml (g/ml)

Lab File ID: KAT_031

Level: (low/med) low

Date Received: 9/23/99

% Moisture: NA

Date Analyzed: 9/24/99

GC Column: Carboxen 1004 OD: 1/16"

Dilution Factor: 10

Soil Extract Volume: NA (µl)

Soil Aliquot Volume: NA (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) µg/L	Q
74-82-8	Methane	6000	D

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
WP4035-5

Lab Name: ENSR Contract:

Lab Code: Case No.: SAS NO.: SDG NO.:

Matrix: (soil/water) water

Lab Sample ID: 990178-5

Sample wt / vol: 32.5 ml (g/ml)

Lab File ID: KAT_032

Level: (low/med) low

Date Received: 9/23/99

% Moisture: NA

Date Analyzed: 9/24/99

GC Column: Carboxen 1004 OD: 1/16"

Dilution Factor: 1

Soil Extract Volume: NA (μl)

Soil Aliquot Volume: NA (μl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (μg/L or PPMv) μg/L	Q
74-82-8	Methane	3500	E

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

WP4035-5 D

Lab Name: ENSR Contract:

Lab Code: Case No.: SAS NO.: SDG NO.:

Matrix: (soil/water) water

Lab Sample ID: 990178-5 DIL

Sample wt / vol: 32.5 ml (g/ml)

Lab File ID: KAT_033

Level: (low/med) low

Date Received: 9/23/99

% Moisture: NA

Date Analyzed: 9/24/99

GC Column: Carboxen 1004 OD: 1/16"

Dilution Factor: 5

Soil Extract Volume: NA (µl)

Soil Aliquot Volume: NA (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) µg/L	Q
74-82-8	Methane	4400	D

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK01

Lab Name: ENSR Contract:

Lab Code: Case No.: SAS NO.: SDG NO.:

Matrix: (soil/water) water

Lab Sample ID: MB990178

Sample wt / vol: 32.5 ml (g/ml)

Lab File ID: KAT_006

Level: (low/med) low

Date Received: NA

% Moisture: NA

Date Analyzed: 9/24/99

GC Column: Carboxen 1004 OD: 1/16"

Dilution Factor: 1

Soil Extract Volume: NA (µl)

Soil Aliquot Volume: NA (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) µg/L	Q
74-82-8	Methane	5.2	U

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

LCS01

Lab Name: ENSR Contract: ______

Lab Code: ______ Case No.: ______ SAS NO.: ______ SDG NO.: ______

Matrix: (soil/water) water

Lab Sample ID: LCS990178

Sample wt / vol: 32.5 ml (g/ml)

Lab File ID: KAT_007

Level: (low/med) low

Date Received: NA

% Moisture: NA

Date Analyzed: 9/24/99

GC Column: Carboxen 1004 OD: 1/16"

Dilution Factor: 1

Soil Extract Volume: NA (µl)

Soil Aliquot Volume: NA (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) µg/L	Q
74-82-8	Methane	210	

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: ENSR Contract: ______

WP3906-28(B) MS

Lab Code: ______ Case No.: ______ SAS NO.: ______ SDG NO.: ______

Matrix: (soil/water) water

Lab Sample ID: 990175-1 MS

Sample wt / vol: 32.5 ml (g/ml)

Lab File ID: KAT_023

Level: (low/med) low

Date Received: 9/16/99

% Moisture: NA

Date Analyzed: 9/24/99

GC Column: Carboxen 1004 OD: 1/16"

Dilution Factor: 1

Soil Extract Volume: NA (µl)

Soil Aliquot Volume: NA (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) µg/L	Q
74-82-8	Methane	340	

ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

WP3906-28(C) MSD

Lab Name: ENSR Contract:

Lab Code: Case No.: SAS NO.: SDG NO.:

Matrix: (soil/water) water

Lab Sample ID: 990175-1 MSD

Sample wt / vol: 32.5 ml (g/ml)

Lab File ID: KAT_024

Level: (low/med) low

Date Received: 9/16/99

% Moisture: NA

Date Analyzed: 9/24/99

GC Column: Carboxen 1004 OD: 1/16"

Dilution Factor: 1

Soil Extract Volume: NA (µl)

Soil Aliquot Volume: NA (µl)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) µg/L	Q
74-82-8	Methane	350	

LABORATORY CONTROL SPIKE RECOVERY

Lab Name: ____ ENSR ______________ Contract: __________________

Lab Code: ____________ Case NO.: ___________ SAS NO.: __________ SDG NO.: ____________

Laboratory Control Sample No: ______ LCS01 ______________________

COMPOUND	SPIKE ADDED (µg/L)	LCS CONCENTRATION (µg/L)	LCS % REC #	QC LIMITS REC.
Methane	205.0	206.7	101%	50 - 150

* - Values outside of QC limits.

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: ____ ENSR ______________ Contract: ____________________

Lab Code: _________________ Case NO.: _____________ SAS NO.: __________ SDG NO.: ___________

Matrix Spike - EPA Sample NO.: __WP3906-28 _____________

COMPOUND	SPIKE ADDED (μg/L)	SAMPLE CONCENTRATION (μg/L)	MS CONCENTRATION (μg/L)	MS % REC	#	QC LIMITS REC.
Methane	205.0	189	344.8	76%		50-150

COMPOUND	SPIKE ADDED (μg/L)	MSD CONCENTRATION (μg/L)	MSD % REC	#	% RPD	#	QC LIMITS RPD	QC LIMITS REC.
Methane	205.0	345.8	77%		0.68%		50	50-150

Spike recovery: _____ 0 ______ out of ____ 2 ___ outside limits.
RPD: ______ 0 _____ out of ___ 1 _____ outside limits.

Comments:

METHOD BLANK SUMMARY

EPA SAMPLE NO.
VBLK01

Lab Name: _____ ENSR ____________ Contract: ____________

Lab Code: ____________ Case No.: _________ SAS NO.: _________ SDG NO.: ____________

Lab File ID: __KAT_006_________ Lab Sample I MB990175

Instrument ID: _____ HPGC#3_________ Date Analyzed:_9/24/99______

Matrix: (soil/water) _____ water ______ Level: (low/med) _______ low _______

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES; MS AND MSD

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	LCS01	LCS990175	KAT_007	09/24/99
02	WP3906-28(B) MS	990175-1 MS	KAT_023	09/24/99
03	WP3906-28(C) MSD	990175-1 MSD	KAT_024	09/24/99
04	WP4035-1	990178-1	KAT_025	09/24/99
05	WP4035-1 D	990178-1 DIL	KAT_026	09/24/99
06	WP4035-2	990178-2	KAT_028	09/24/99
07	WP4035-3	990178-3	KAT_029	09/24/99
08	WP4035-4	990178-4	KAT_030	09/24/99
09	WP4035-4 D	990178-4 DIL	KAT_031	09/24/99
10	WP4035-5	990178-5	KAT_032	09/24/99
11	WP4035-5 D	990178-5 DIL	KAT_033	09/24/99
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COMMENTS:

Katahdin
ANALYTICAL SERVICES

SDG NARRATIVE
KATAHDIN ANALYTICAL SERVICES
TETRA TECH NUS
CASE CNC CHARLESTON

Sample Receipt

The following samples were received on June 8, 1999 and were logged in under Katahdin Analytical Services work order number WP2792 for a hardcopy due date of July 8, 1999.

KATAHDIN Sample No.	TTNUS Sample Identification		GEL Sample No.
WP2792-1	25SLB090304		
WP2792-2	25SLB100102		
WP2792-3	25SLB110203		
WP2792-4	25SLB130203		9906242-01
WP2792-5	25SLB130203D		9906242-02
WP2792-6	25SLB140304		
WP2792-7	25SLB160304		
WP2792-8	25SLB170304		
WP2792-9	25SLB120203	GRAIN SIZE	
WP2792-10	25SLB120708		
WP2792-11	25TL00501		
WP2792-12	25SLB150304		9906242-03
WP2792-13	25SLB150304D		9906242-04

The samples were logged in for the analyses specified on the chain of custody form. All problems encountered and resolved during sample receipt have been documented on the applicable chain of custody forms.

Sample analyses have been performed by the methods as noted herein.

Volatile Organic Analysis

Twelve soil samples were received by the Katahdin Analytical Services, Inc. GC/MS laboratory on June 8, 1999 and were specified to be analyzed by USEPA method 8260B for the analytes benzene, toluene, ethylbenzene, xylenes, MTBE, naphthalene, and EDB.

Analyses for this workorder were performed on the 5972-F, 5972-M, and 5972-Z instruments. A VSTD050 (50 ppb standard) was used for the continuing calibration standard. Internal standard and surrogate compounds were also spiked at 50 ug/l.

Batch QC (VBLK, and LCS) was performed in each twelve-hour window. Results are included

340 County Road No. 5
P.O. Box 720, Westbrook, ME 04098
Tel: (207) 874-2400 Fax: (207) 775-4029
http://katahdinlab.com
210 West Road No. 5, Portsmouth, NH 03801
Tel: (603) 431-5777 Fax: (603) 436-3356

in this data package. The LCS QC samples were spiked with the entire list of compounds quantitated for at 50 ppb. No matrix spike/matrix spike duplicate was performed on any sample in this workorder.

Method 8000B, section 7.5.1.2.1 (Revision 2, 12/96) states, "in those instances where the RSD for one or more analytes exceeds 20%, the initial calibration curve may still be acceptable if the mean of the RSD values for all analytes in the calibration is less than or equal to 20%." Method 8260B narrows this 20% maximum to 15%.

The calibration curves in this workorder had several analytes exceeding the maximum allowable 15% RSD. Since the average %RSDs were 8.3%, 12.3%, 10.9%, and 13.3%, the curves were acceptable.

Initial analyses of samples WP2792-2, -4, -5, -8, and -9 following medium level protocols yielded target analyte concentrations over the upper limit of the calibration curve. Analyses of samples WP2792-5 and -9 also yielded surrogate recovery deviations. Reanalyses occurred at 1:2, 1:10, 1:50, 1:20, and 1:100 dilutions, respectively, successfully. Both sets of data are included in this data package for each sample.

Initial analysis of sample WP2792-6 following low level protocols yielded internal standard area and surrogate recovery deviations. Reanalysis yielded internal standard area recovery deviations, confirming matrix interference. Both sets of data are included in this data package.

Several manual integrations were performed due to split peaks; all have been flagged with a "M" (software-generated) on the pertinent quantitation reports. All "M" flags have been dated and initialed by the analyst performing the integration. In addition, all "M" flags have been reviewed and approved by the GC/MS supervisor. Copies of each manual integration are included in the pertinent quantitation reports.

No other protocol deviations were noted by the volatile organics staff.

Semivolatile Organic Analysis

Nine soil/sediment samples were received by Katahdin Analytical Services laboratory on June 8, 1999 for analysis in accordance with 8270C for the PAH list of analytes.

Extraction of the samples occurred following USEPA method 3550 on June 16, 1999. A laboratory control spike consisting of all PAH analytes spiked into organic free sand, was extracted in the batch.

The initial calibration curve analyzed in this SDG had some of the target analyte %RSD values exceeding 15 %.

Method 8000B, section 7.5.1.2.1 (Revision 2, 12/96) states, "in those instances where the RSD for one or more analytes exceeds 20%, the initial calibration curve may still be acceptable if the

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210 West Road No. 5, Portsmouth, NH 03801
Tel: (603) 431-5777 Fax: (603) 436-3356

mean of the RSD values for all analytes in the calibration is less than or equal to 20%." Section 7.3.7.1 of method 8270C (revision 3, 12/96) narrows this 20% maximum to 15%.

In the calibration curve analyzed in this SDG, the average %RSD for all analytes was 9.1%, making the curve acceptable.

Initial analyses of samples WP2792-4, -5, and -9 yielded target analyte concentrations over the upper limit of the calibration curve. Analysis of sample WP2792-9 also yielded an internal standard area recovery deviation. Reanalyses occurred at 1:5, 1:100, and 1:5 dilutions, respectively. Both sets of data for each sample are included in this data package.

Several manual integrations were performed due to split peaks; all have been flagged with a "M" by the data system. All manual integrations have been dated and initialed by the responsible analyst. Copies of each manual integration are included in the data package. All manual integrations have been reviewed and approved by the GC/MS supervisor.

No other protocol deviations were noted by the semivolatiles organics staff.

Metals Analysis

The samples of Katahdin Work Order WP2792 were prepared and analyzed for metals in accordance with the "Test Methods for Evaluating Solid Waste", SW-846, November 1986, Third Edition.

Inductively-Coupled Plasma (ICP) Atomic Emission Spectroscopic Analysis

Soil-matrix Katahdin Sample Nos. WP2792-(1-5) were originally digested for lead analysis on 07/07/99 (QC Batch PG07ICS0) in accordance with USEPA Method 3050B. Katahdin Sample No. WP2989-1 was prepared with duplicate matrix-spiked aliquots.

ICP analyses of Katahdin Work Order WP2792 sample digestates were performed in accordance with USEPA Method 6010B, using a Thermo Jarrell Ash Trace ICP. All samples were analyzed within holding times and all QC criteria were met with the following comments or exceptions:

Some of the results for run QC samples (ICV, ICB, CCV, CCB, ICSA, and ICSAB) included in the accompanying data package may have exceeded acceptance limits for some elements. Please note that all client samples and batch QC samples associated with out-of-control results for run QC samples were subsequently reanalyzed for the analytes in question.

Wet Chemistry Analysis

For work order WP2792 the analyses for Total Combustible Organics (TCO) have been performed in accordance with the "Annual Book of ASTM Standards", 1987. Analyses for Solids-Total Residue (TS) for work order WP2792 samples have been performed in accordance

340 County Road No. 5
P.O. Box 720, Westbrook, ME 04098
Tel: (207) 874-2400 Fax: (207) 775-4029

http://katahdinlab.com

210 West Road No. 5, Portsmouth, NH 03801
Tel: (603) 431-5777 Fax: (603) 436-3356

with "Contract Laboratory Program Statement of Work for Inorganic Analysis".

All analyses were performed within analytical hold time. No protocol deviations were noted by the Wet Chemistry laboratory staff.

Subcontracted Analysis

Analyses for Total Organic Carbon, Total Petroleum Hydrocarbon and Grain size were subcontracted to outside laboratories. All sets of data are included as separate sections to the data package.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager and/or his designee, as verified by the following signature.

Deborah J. Nadeau
Authorized Signature
8.12.99

340 County Road No. 5
P.O. Box 720, Westbrook, ME 04098
Tel: (207) 874-2400 Fax: (207) 775-4029

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210 West Road No. 5, Portsmouth, NH 03801
Tel: (603) 431-5777 Fax: (603) 436-3356

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT

Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) #: WP 2792

PAGE: 1 OF 1

COOLER: 1 OF 1

COC#: —
SDG#: —
DATE / TIME RECEIVED: 6-8-99 1015
DELIVERED BY: Fed Ex
RECEIVED BY: Sam
LIMS ENTRY BY: BKW
LIMS REVIEW BY / PM: ASC

CLIENT: Tetra Tech -SC

PROJECT: CNC Charleston

	YES	NO	EXCEPTIONS
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☑	☐	☐
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☐	☑	☐
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT Y or N?	☐	☑	☐
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐
8. TRIP BLANK PRESENT IN THIS COOLER	☑	☐	☐
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐
11. SAMPLES PROPERLY PRESERVED[1]?	☑	☐	☑ ASC 6/8/99
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A

COMMENTS

(1)

TEMP BLANK TEMP (°C)= 1.0
temp blank under bag of ice.
COOLER TEMP (°C)= NA
(RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)

RESOLUTION

Client said to add 25SLB120708 to COC for grain size

ASC contacted Bryan Hanze by phone & Paul Calligan by fax 6/8/99

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP NFESC ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]: Sample ID 25SLB120203 only has 7 containers, there is an extra container ID 25SLB120708 for grain size that is not on the chain (no time on container but date matches); ~~Sample ID 25SLB150304 has to containers but none labeled for TOC~~ ASC 6/8/99

(1) Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative added.

0000009

Katahdin ANALYTICAL SERVICES

340 County Road No. 5
P.O. Box 720
Westbrook, ME 04098
Tel: (207) 874-2400
Fax: (207) 775-4029

CHAIN of CUSTODY

PLEASE PRINT IN PEN

Client: Tetra Tech NUS
Contact: Bryn Howze
Phone #: (843) 814-9080
Fax #: ( )

Address: NH21 Ave H
City: N. Charleston
State: SC
Zip Code: 2940

Purchase Order #:
Proj. Name / No.:
Katahdin Quote #:

Bill (if different than above):
Address:

Sampler (Print / Sign): Roger Franklin / [signature]
Copies To:

LAB USE ONLY

WORK ORDER #: WP 2792
KATAHDIN PROJECT MANAGER:

REMARKS:

SHIPPING INFO: ☒ FED EX ☐ UPS ☐ CLIENT
AIRBILL NO: 809609650221
TEMP°C ____ ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

ANALYSIS AND CONTAINER TYPE PRESERVATIVES

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	PAH Naphth. 4 oz	BTEX/EDB 5 gram encore	Lead 4 oz	Grain Size 32 oz (4 oz full)	FOC				FID Readings ppm	
	25SLB090304	6/7/99/0858	Soil	6	X	X	X						106	
	25SLB100102	6/7/99/0915	Soil	6	X	X	X						>5000	
	25SLB110203	6/7/99/0935	Soil	6	X	X	X						1610	
	25SLB120203	6/7/99/1015	Soil	8	X	X	X	X					>5000	
	25SLB130203	6/7/99/1040	Soil	6	X	X	X						>50	
	25SLB130203D	6/7/99/1040	Soil	6	X	X	X						~~820~~	>500
	25SLB140304	6/7/99/1055	Soil	6	X	X	X						820	
	25SLB150304	6/7/99/1115	Soil	6	X	X	X		X				150	
	25SLB160304	6/7/99/1330	Soil	6	X	X	X						250	
	25SLB170304	6/7/99/1355	Soil	6	X	X	X						>5000	
	25TL00501	6/7/99/ –	Water	2		2								
	25SLB120708	6/7/99/						X						
		/												
		/												
		/												
		/												

COMMENTS

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
[signature]	6/7/99 1800	Fed Ex		6-8-99 1015	Shelley W[illegible]
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

0000007

FORMSOURCE INC. ☎ (207) 782-3311
FORM # CHN-OF-CSTDY

ORIGINAL

New England-ME Laboratory (207) 874-2400
CONFIRMATION

ORDER NO WP-2792

Project Manager: Andrea J. Colby
ORDER DATE: 06/08/99
PHONE: 850/385-9899
FAX: 850/385-9860
DUE: 08 JUL
FAC.ID: CNC CHARLESTON

REPORT TO: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
661 ANDERSEN DRIVE, FOSTER PLAZA VII
PITTSBURGH, PA 15220-2745

PHONE: 412/921-7090
PO: N7912-P99264
PROJECT: CTO #68

SAMPLED BY: ROGER FRANKLIN DELIVERED BY: FEDEX DISPOSE: AFTER 07 AUG

ITEM	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
1	WP2792-1	25SLB090304	07 JUN 0858	08 JUN	SL
	WP2792-2	25SLB100102	07 JUN 0915		
	WP2792-3	25SLB110203	07 JUN 0935		
	WP2792-6	25SLB140304	07 JUN 1055		
	WP2792-7	25SLB160304	07 JUN 1330		
	WP2792-8	25SLB170304	07 JUN 1355		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Polynuclear Aromatic Hydrocarbons	EPA 8270	6	135.00	810.00
Volatile Organics by 8260B	SW8260	6	85.00	510.00
Solids-Total Residue (TS)	CLP/CIP SO	6	0.00	0.00
Lead, Total	6010	6	20.00	120.00
TOTALS		6	240.00	1440.00

ITEM	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
2	WP2792-9	25SLB120203	07 JUN 1015	08 JUN	SL

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Polynuclear Aromatic Hydrocarbons	EPA 8270	1	135.00	135.00
Volatile Organics by 8260B	SW8260	1	85.00	85.00
Solids-Total Residue (TS)	CLP/CIP SO	1	0.00	0.00
Lead, Total	6010	1	20.00	20.00
Wet Lab Subcontract		1	110.00	110.00
TOTALS		1	350.00	350.00

ITEM	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
3	WP2792-10	25SLB120708	07 JUN	08 JUN	SL

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Wet Lab Subcontract		1	110.00	110.00

LABORATORY ORDER CONTINUED ON PAGE 2

0000008

[illegible]

ORDER NO WP-2792

Project Manager: Andrea J. Colby
ORDER DATE: 06/08/99
PHONE: 850/385-9899
FAX: 850/385- 0
DUE: 08 JUL
FAC.ID: CNC CHARLESTON

REPORT TO: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
661 ANDERSEN DRIVE, FOSTER PLAZA VII
PITTSBURGH, PA 15220-2745

PHONE: 412/921-7090
PO: N7912-P99264
PROJECT: CTO #68

SAMPLED BY: ROGER FRANKLIN DELIVERED BY: FEDEX DISPOSE: AFTER 07 AUG

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
4	WP2792-11	25TL00501	07 JUN	08 JUN	SL

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	1	85.00	85.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
5	WP2792-12	25SLB150304	07 JUN 1115	08 JUN	SL

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Polynuclear Aromatic Hydrocarbons	EPA 8270	1	135.00	135.00
Solids-Total Residue (TS)	CLP/CIP SO	1	0.00	0.00
Volatile Organics by 8260B	SW8260	1	85.00	85.
Lead, Total	6010	1	20.00	20.
Total Combustible Organics	ASTM D2974	1	30.00	30.00
Wet Lab Subcontract		1	60.00	60.00
TOTALS		1	330.00	330.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
6	WP2792-4	25SLB130203	07 JUN 1040	08 JUN	SL
	WP2792-5	25SLB130203D	07 JUN 1040		

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Polynuclear Aromatic Hydrocarbons	EPA 8270	2	135.00	270.00
Volatile Organics by 8260B	SW8260	2	85.00	170.00
Solids-Total Residue (TS)	CLP/CIP SO	2	0.00	0.00
Lead, Total	6010	2	20.00	40.00
Wet Lab Subcontract		2	75.00	150.00
TOTALS		2	315.00	630.00

LABORATORY ORDER CONTINUED ON PAGE 3

6/14/9c

ORDER NO WP-2792

Project Manager: Andrea J. Colby
ORDER DATE: 06/08/99
PHONE: 850/385-9899
FAX: 850/385-9860
DUE: 08 JUL
FAC.ID: CNC CHARLESTON

REPORT TO: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

INVOICE: ACCOUNTS PAYABLE
TETRA TECH NUS, INC.
661 ANDERSEN DRIVE, FOSTER PLAZA VII
PITTSBURGH, PA 15220-2745

PHONE: 412/921-7090
PO: N7912-P99264
PROJECT: CTO #68

SAMPLED BY: ROGER FRANKLIN DELIVERED BY: FEDEX DISPOSE: AFTER 07 AUG

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
7	WP2792-13	25SLB150304D	07 JUN 1115	07 JUN	SL

DETERMINATION	METHOD	QTY	PRICE	AMOUNT
Wet Lab Subcontract		1	60.00	60.00

ORDER NOTE: QC-IV NFESC-D
DD(KAS007QC-DB3)
CNC CHARLESTON
REPORT COPY: MS. LEE LECK
TETRA TECH NUS
FOSTER PALZA 7
661 ANDERSEN DR.
PITTSBURGH,PA 15220

INVOICE: With Report

TOTAL ORDER AMOUNT $3,005.00
This is NOT an Invoice

C/BKR/WEST.AJC(dw)
06-14Please contact KATAHDIN ANALYTICAL SERVICES promptly if you have any questi

0000010

KATAHDIN ANALYTICAL SERVICES
Summary of Report Notes

Report Note	Note Text
DL	'DL' flag denotes inability to calculate surrogate recovery due to sample dilution.
E	'E' flag indicates an estimated value. The analyte was detected in the sample at a concentration greater than the standard calibration range.
J	'J' flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.
O-2	Sample dilution required for quantitation of one or more target analytes; therefore, standard laboratory Practical Quantitation Level (PQL) could not be achieved.

KATAHDIN ANALYTICAL SERVICES

Summary of Report Notes

Report Note	Note Text
#	'#' flag denotes surrogate compound recovery is out of criteria.
E	'E' flag indicates an estimated value. The analyte was detected in the sample at a concentration greater than the standard calibration range.
J	'J' flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.
O-1	Sample dilution required due to matrix interference, sample viscosity or other matrix-related problem; therefore, standard laboratory Practical Quantitation Level (PQL) could not be achieved.
O-13	Internal standard area(s) are out of criteria. Reanalysis confirmedmatrix interference.
O-2	Sample dilution required for quantitation of one or more target analytes; therefore, standard laboratory Practical Quantitation Level (PQL) could not be achieved.

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP2792-1
SDG: WP2792
Report Date: 8/5/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 81
Method: EPA 8270
Date Analyzed: 7/23/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25SLB090304	SL	6/7/99	6/8/99	6/16/99	PMM	EPA 3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<400	ug/Kg	1.2	400	330
2-METHYLNAPHTHALENE	<400	ug/Kg	1.2	400	330
ACENAPHTHYLENE	<400	ug/Kg	1.2	400	330
ACENAPHTHENE	<400	ug/Kg	1.2	400	330
FLUORENE	<400	ug/Kg	1.2	400	330
PHENANTHRENE	<400	ug/Kg	1.2	400	330
ANTHRACENE	<400	ug/Kg	1.2	400	330
FLUORANTHENE	<400	ug/Kg	1.2	400	330
PYRENE	<400	ug/Kg	1.2	400	330
BENZO[A]ANTHRACENE	<400	ug/Kg	1.2	400	330
CHRYSENE	<400	ug/Kg	1.2	400	330
BENZO[B]FLUORANTHENE	<400	ug/Kg	1.2	400	330
BENZO[K]FLUORANTHENE	<400	ug/Kg	1.2	400	330
BENZO[A]PYRENE	<400	ug/Kg	1.2	400	330
INDENO[1,2,3-CD]PYRENE	<400	ug/Kg	1.2	400	330
DIBENZ[A,H]ANTHRACENE	<400	ug/Kg	1.2	400	330
BENZO[G,H,I]PERYLENE	<400	ug/Kg	1.2	400	330
NITROBENZENE-D5	42	%	1.2		
2-FLUOROBIPHENYL	48	%	1.2		
TERPHENYL-D14	86	%	1.2		

Report Notes:

Katahdin ANALYTICAL SERVICES

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP2792-1
SDG: WP2792
Report Date: 8/2/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 81
Method: SW8260
Date Analyzed: 6/16/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25SLB090304	SL	6/7/99	6/8/99	6/16/99	KRT	5030	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	52	ug/Kg	1.2	6	5
TOLUENE	15	ug/Kg	1.2	6	5
1,2-DIBROMOETHANE	<6	ug/Kg	1.2	6	5
ETHYLBENZENE	<6	ug/Kg	1.2	6	5
NAPHTHALENE	J4	ug/Kg	1.2	6	5
MTBE	<6	ug/Kg	1.2	6	5
TOTAL XYLENES	<6	ug/Kg	1.2	6	5
DIBROMOFLUOROMETHANE	88	%	1.2		
1,2-DICHLOROETHANE-D4	92	%	1.2		
TOLUENE-D8	86	%	1.2		
P-BROMOFLUOROBENZENE	72	%	1.2		

Report Notes: J

INORGANIC ANALYSIS DATA SHEET

Lab Name: Katahdin Analytical Services

Client Field ID: 25SLB090304

Matrix: SOIL

SDG Name: WP2792

Percent Solids: 80.8

Lab Sample ID: WP2792-001

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

CAS No.	Analyte	Concentration	C	Q	M	DF
7439-92-1	LEAD	10.5			P	1

Color Before: BROWN

Texture: MEDIUM

Color After: YELLOW

Clarity After: CLEAR

Comments:

FORM I - IN

Katahdin
ANALYTICAL SERVICES

CLIENT: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

Lab Number : WP-2792-1
Report Date: 08/11/99
PO No. : N7912-P99264
Project : CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
25SLB090304	Solid	ROGER FRANKLIN	06/07/99	06/08/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	81.	wt %	1.0	0.10	CLP/CIP SOW	06/14/99	JF	1

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.
(1) Sample Preparation on 06/11/99 by JF

08/11/99

LJO/baeajc(dw)/msm
PF11TSS7
CC: MS. LEE LECK
TETRA TECH NUS
FOSTER PALZA 7
661 ANDERSEN DR.

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP2792-2
SDG: WP2792
Report Date: 8/5/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 68
Method: EPA 8270
Date Analyzed: 7/23/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25SLB100102	SL	6/7/99	6/8/99	6/16/99	PMM	EPA 3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	2200	ug/Kg	1.5	460	330
2-METHYLNAPHTHALENE	1600	ug/Kg	1.5	460	330
ACENAPHTHYLENE	<460	ug/Kg	1.5	460	330
ACENAPHTHENE	<460	ug/Kg	1.5	460	330
FLUORENE	<460	ug/Kg	1.5	460	330
PHENANTHRENE	<460	ug/Kg	1.5	460	330
ANTHRACENE	<460	ug/Kg	1.5	460	330
FLUORANTHENE	<460	ug/Kg	1.5	460	330
PYRENE	<460	ug/Kg	1.5	460	330
BENZO[A]ANTHRACENE	<460	ug/Kg	1.5	460	330
CHRYSENE	<460	ug/Kg	1.5	460	330
BENZO[B]FLUORANTHENE	<460	ug/Kg	1.5	460	330
BENZO[K]FLUORANTHENE	<460	ug/Kg	1.5	460	330
BENZO[A]PYRENE	<460	ug/Kg	1.5	460	330
INDENO[1,2,3-CD]PYRENE	<460	ug/Kg	1.5	460	330
DIBENZ[A,H]ANTHRACENE	<460	ug/Kg	1.5	460	330
BENZO[G,H,I]PERYLENE	<460	ug/Kg	1.5	460	330
NITROBENZENE-D5	49	%	1.5		
2-FLUOROBIPHENYL	57	%	1.5		
TERPHENYL-D14	75	%	1.5		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP2792-2
SDG: WP2792
Report Date: 8/2/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 68
Method: SW8260
Date Analyzed: 6/11/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25SLB100102	SL	6/7/99	6/8/99	6/11/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	6100	ug/Kgdrywt	160	800	5
TOLUENE	<800	ug/Kgdrywt	160	800	5
1,2-DIBROMOETHANE	<800	ug/Kgdrywt	160	800	5
ETHYLBENZENE	E39000	ug/Kgdrywt	160	800	5
NAPHTHALENE	21000	ug/Kgdrywt	160	800	5
MTBE	<800	ug/Kgdrywt	160	800	5
TOTAL XYLENES	1800	ug/Kgdrywt	160	800	5
DIBROMOFLUOROMETHANE	92	%	160		
1,2-DICHLOROETHANE-D4	104	%	160		
TOLUENE-D8	108	%	160		
P-BROMOFLUOROBENZENE	120	%	160		

Report Notes: E

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP2792-2DL
SDG: WP2792
Report Date: 8/2/99
PO No.: N7912-P99264
Project: CTO #68
% Solids: 68
Method: SW8260
Date Analyzed: 6/14/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25SLB100102	SL	6/7/99	6/8/99	6/14/99	DJP	5030	DJP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	9100	ug/Kgdrywt	320	1600	5
TOLUENE	<1600	ug/Kgdrywt	320	1600	5
1,2-DIBROMOETHANE	<1600	ug/Kgdrywt	320	1600	5
ETHYLBENZENE	63000	ug/Kgdrywt	320	1600	5
NAPHTHALENE	30000	ug/Kgdrywt	320	1600	5
MTBE	<1600	ug/Kgdrywt	320	1600	5
TOTAL XYLENES	3000	ug/Kgdrywt	320	1600	5
DIBROMOFLUOROMETHANE	95	%	320		
1,2-DICHLOROETHANE-D4	96	%	320		
TOLUENE-D8	106	%	320		
P-BROMOFLUOROBENZENE	109	%	320		

Report Notes: O-2

INORGANIC ANALYSIS DATA SHEET

Lab Name: Katahdin Analytical Services

Client Field ID: 25SLB100102

Matrix: SOIL

SDG Name: WP2792

Percent Solids: 68.5

Lab Sample ID: WP2792-002

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

CAS No.	Analyte	Concentration	C	Q	M	DF
7439-92-1	LEAD	34.7			P	1

Color Before: BROWN

Texture: MEDIUM

Color After: YELLOW

Clarity After: CLEAR

Comments:

FORM I - IN

Katahdin
ANALYTICAL SERVICES

CLIENT: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

Lab Number : WP-2792-2
Report Date: 08/11/99
PO No. : N7912-P99264
Project : CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
25SLB100102	Solid	ROGER FRANKLIN	06/07/99	06/08/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	69.	wt %	1.0	0.10	CLP/CIP SOW	06/14/99	JF	1

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.
(1) Sample Preparation on 06/11/99 by JF

08/11/99

LJO/baeajc(dw)/msm
PF11TSS7
CC: MS. LEE LECK
TETRA TECH NUS
FOSTER PALZA 7
661 ANDERSEN DR.

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP2792-3
SDG: WP2792
Report Date: 8/5/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 87
Method: EPA 8270
Date Analyzed: 7/23/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25SLB110203	SL	6/7/99	6/8/99	6/16/99	PMM	EPA 3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	J250	ug/Kg	1.1	360	330
2-METHYLNAPHTHALENE	<360	ug/Kg	1.1	360	330
ACENAPHTHYLENE	<360	ug/Kg	1.1	360	330
ACENAPHTHENE	<360	ug/Kg	1.1	360	330
FLUORENE	<360	ug/Kg	1.1	360	330
PHENANTHRENE	<360	ug/Kg	1.1	360	330
ANTHRACENE	<360	ug/Kg	1.1	360	330
FLUORANTHENE	<360	ug/Kg	1.1	360	330
PYRENE	<360	ug/Kg	1.1	360	330
BENZO[A]ANTHRACENE	<360	ug/Kg	1.1	360	330
CHRYSENE	<360	ug/Kg	1.1	360	330
BENZO[B]FLUORANTHENE	<360	ug/Kg	1.1	360	330
BENZO[K]FLUORANTHENE	<360	ug/Kg	1.1	360	330
BENZO[A]PYRENE	<360	ug/Kg	1.1	360	330
INDENO[1,2,3-CD]PYRENE	<360	ug/Kg	1.1	360	330
DIBENZ[A,H]ANTHRACENE	<360	ug/Kg	1.1	360	330
BENZO[G,H,I]PERYLENE	<360	ug/Kg	1.1	360	330
NITROBENZENE-D5	53	%	1.1		
2-FLUOROBIPHENYL	60	%	1.1		
TERPHENYL-D14	81	%	1.1		

Report Notes: J

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Katahdin Analytical Services

Client:	Paul Calligan Tetra Tech NUS 1401 Oven Park Dr. Suite 102 Tallahassee, FL 32308	**Lab Number:**	WP2792-3
		SDG:	WP2792
		Report Date:	8/2/99
		PO No. :	N7912-P99264
		Project:	CTO #68
Proj. ID:	CNC CHARLESTON	**% Solids:**	87
		Method:	SW8260
		Date Analyzed:	6/11/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25SLB110203	SL	6/7/99	6/8/99	6/11/99	DJP	5030	DJP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	J6	ug/Kg	1.1	6	5
TOLUENE	<6	ug/Kg	1.1	6	5
1,2-DIBROMOETHANE	<6	ug/Kg	1.1	6	5
ETHYLBENZENE	14	ug/Kg	1.1	6	5
NAPHTHALENE	66	ug/Kg	1.1	6	5
MTBE	<6	ug/Kg	1.1	6	5
TOTAL XYLENES	19	ug/Kg	1.1	6	5
DIBROMOFLUOROMETHANE	82	%	1.1		
1,2-DICHLOROETHANE-D4	92	%	1.1		
TOLUENE-D8	94	%	1.1		
P-BROMOFLUOROBENZENE	88	%	1.1		

Report Notes: J

INORGANIC ANALYSIS DATA SHEET

Lab Name: Katahdin Analytical Services

Matrix: SOIL

Percent Solids: 87.4

Client Field ID: 25SLB110203

SDG Name: WP2792

Lab Sample ID: WP2792-003

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

CAS No.	Analyte	Concentration	C	Q	M	DF
7439-92-1	LEAD	125			P	1

Color Before: BROWN

Color After: YELLOW

Texture: MEDIUM

Clarity After: CLEAR

Comments:

FORM I - IN

Katahdin
ANALYTICAL SERVICES

CLIENT: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

Lab Number : WP-2792-3
Report Date: 08/11/99
PO No. : N7912-P99264
Project : CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
25SLB110203	Solid	ROGER FRANKLIN	06/07/99	06/08/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	87.	wt %	1.0	0.10	CLP/CIP SOW	06/14/99	JF	1

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.
(1) Sample Preparation on 06/11/99 by JF

08/11/99

LJO/baeajc(dw)/msm
PF11TSS7
CC: MS. LEE LECK
TETRA TECH NUS
FOSTER PALZA 7
661 ANDERSEN DR.

KATAHDIN ANALYTICAL SERVICES

REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP2792-4
SDG: WP2792
Report Date: 8/5/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 85
Method: EPA 8270
Date Analyzed: 7/23/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25SLB130203	SL	6/7/99	6/8/99	6/16/99	PMM	EPA 3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	E14000	ug/Kg	1.2	400	330
2-METHYLNAPHTHALENE	E9600	ug/Kg	1.2	400	330
ACENAPHTHYLENE	<400	ug/Kg	1.2	400	330
ACENAPHTHENE	<400	ug/Kg	1.2	400	330
FLUORENE	<400	ug/Kg	1.2	400	330
PHENANTHRENE	<400	ug/Kg	1.2	400	330
ANTHRACENE	<400	ug/Kg	1.2	400	330
FLUORANTHENE	<400	ug/Kg	1.2	400	330
PYRENE	J280	ug/Kg	1.2	400	330
BENZO[A]ANTHRACENE	<400	ug/Kg	1.2	400	330
CHRYSENE	<400	ug/Kg	1.2	400	330
BENZO[B]FLUORANTHENE	<400	ug/Kg	1.2	400	330
BENZO[K]FLUORANTHENE	<400	ug/Kg	1.2	400	330
BENZO[A]PYRENE	<400	ug/Kg	1.2	400	330
INDENO[1,2,3-CD]PYRENE	<400	ug/Kg	1.2	400	330
DIBENZ[A,H]ANTHRACENE	<400	ug/Kg	1.2	400	330
BENZO[G,H,I]PERYLENE	<400	ug/Kg	1.2	400	330
NITROBENZENE-D5	47	%	1.2		
2-FLUOROBIPHENYL	71	%	1.2		
TERPHENYL-D14	75	%	1.2		

Report Notes: J, E

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client:	Paul Calligan Tetra Tech NUS 1401 Oven Park Dr. Suite 102 Tallahassee, FL 32308	**Lab Number:**	WP2792-4DL
		SDG:	WP2792
		Report Date:	8/5/99
		PO No. :	N7912-P99264
		Project:	CTO #68
Proj. ID:	CNC CHARLESTON	**% Solids:**	85
		Method:	EPA 8270
		Date Analyzed:	7/26/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25SLB130203	SL	6/7/99	6/8/99	6/16/99	PMM	EPA 3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	15000	ug/Kg	5.9	1900	330
2-METHYLNAPHTHALENE	10000	ug/Kg	5.9	1900	330
ACENAPHTHYLENE	<1900	ug/Kg	5.9	1900	330
ACENAPHTHENE	<1900	ug/Kg	5.9	1900	330
FLUORENE	<1900	ug/Kg	5.9	1900	330
PHENANTHRENE	<1900	ug/Kg	5.9	1900	330
ANTHRACENE	<1900	ug/Kg	5.9	1900	330
FLUORANTHENE	<1900	ug/Kg	5.9	1900	330
PYRENE	<1900	ug/Kg	5.9	1900	330
BENZO[A]ANTHRACENE	<1900	ug/Kg	5.9	1900	330
CHRYSENE	<1900	ug/Kg	5.9	1900	330
BENZO[B]FLUORANTHENE	<1900	ug/Kg	5.9	1900	330
BENZO[K]FLUORANTHENE	<1900	ug/Kg	5.9	1900	330
BENZO[A]PYRENE	<1900	ug/Kg	5.9	1900	330
INDENO[1,2,3-CD]PYRENE	<1900	ug/Kg	5.9	1900	330
DIBENZ[A,H]ANTHRACENE	<1900	ug/Kg	5.9	1900	330
BENZO[G,H,I]PERYLENE	<1900	ug/Kg	5.9	1900	330
NITROBENZENE-D5	37	%	5.9		
2-FLUOROBIPHENYL	63	%	5.9		
TERPHENYL-D14	60	%	5.9		

Report Notes: O-2

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP2792-4
SDG: WP2792
Report Date: 8/2/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 85
Method: SW8260
Date Analyzed: 6/9/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25SLB130203	SL	6/7/99	6/8/99	6/9/99	HMP	5035	HMP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	5000	ug/Kgdrywt	120	600	5
TOLUENE	8400	ug/Kgdrywt	120	600	5
1,2-DIBROMOETHANE	<600	ug/Kgdrywt	120	600	5
ETHYLBENZENE	E84000	ug/Kgdrywt	120	600	5
NAPHTHALENE	E43000	ug/Kgdrywt	120	600	5
MTBE	<600	ug/Kgdrywt	120	600	5
TOTAL XYLENES	140000	ug/Kgdrywt	120	600	5
DIBROMOFLUOROMETHANE	88	%	120		
1,2-DICHLOROETHANE-D4	106	%	120		
TOLUENE-D8	89	%	120		
P-BROMOFLUOROBENZENE	98	%	120		

Report Notes: E

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP2792-4DL
SDG: WP2792
Report Date: 8/2/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 85
Method: SW8260
Date Analyzed: 6/10/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25SLB130203	SL	6/7/99	6/8/99	6/10/99	DJP	5030	DJP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	J5000	ug/Kgdrywt	1200	6000	5
TOLUENE	7600	ug/Kgdrywt	1200	6000	5
1,2-DIBROMOETHANE	<6000	ug/Kgdrywt	1200	6000	5
ETHYLBENZENE	73000	ug/Kgdrywt	1200	6000	5
NAPHTHALENE	70000	ug/Kgdrywt	1200	6000	5
MTBE	<6000	ug/Kgdrywt	1200	6000	5
TOTAL XYLENES	160000	ug/Kgdrywt	1200	6000	5
DIBROMOFLUOROMETHANE	92	%	1200		
1,2-DICHLOROETHANE-D4	87	%	1200		
TOLUENE-D8	103	%	1200		
P-BROMOFLUOROBENZENE	104	%	1200		

Report Notes: J, O-1, O-2

INORGANIC ANALYSIS DATA SHEET

Lab Name: Katahdin Analytical Services

Client Field ID: 25SLB130203

Matrix: SOIL

SDG Name: WP2792

Percent Solids: 85.4

Lab Sample ID: WP2792-004

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

CAS No.	Analyte	Concentration	C	Q	M	DF
7439-92-1	LEAD	6.2			P	1

Color Before: BROWN

Texture: MEDIUM

Color After: YELLOW

Clarity After: CLEAR

Comments:

FORM I - IN

Katahdin
ANALYTICAL SERVICES

CLIENT: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

Lab Number : WP-2792-4
Report Date: 08/11/99
PO No. : N7912-P99264
Project : CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
25SLB130203	Solid	ROGER FRANKLIN	06/07/99	06/08/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	85.	wt %	1.0	0.10	CLP/CIP SOW	06/14/99	JF	1

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.
(1) Sample Preparation on 06/11/99 by JF

08/11/99

LJO/baeajc(dw)/msm
PF11TSS7
CC: MS. LEE LECK
TETRA TECH NUS
FOSTER PALZA 7
661 ANDERSEN DR

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client:	Paul Calligan Tetra Tech NUS 1401 Oven Park Dr. Suite 102 Tallahassee, FL 32308	**Lab Number:**	WP2792-5
		SDG:	WP2792
		Report Date:	8/5/99
		PO No. :	N7912-P99264
		Project:	CTO #68
Proj. ID:	CNC CHARLESTON	**% Solids:**	81
		Method:	EPA 8270
		Date Analyzed:	7/23/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25SLB130203D	SL	6/7/99	6/8/99	6/16/99	PMM	EPA 3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	E86000	ug/Kg	1.2	400	330
2-METHYLNAPHTHALENE	E62000	ug/Kg	1.2	400	330
ACENAPHTHYLENE	420	ug/Kg	1.2	400	330
ACENAPHTHENE	560	ug/Kg	1.2	400	330
FLUORENE	420	ug/Kg	1.2	400	330
PHENANTHRENE	1100	ug/Kg	1.2	400	330
ANTHRACENE	J330	ug/Kg	1.2	400	330
FLUORANTHENE	450	ug/Kg	1.2	400	330
PYRENE	750	ug/Kg	1.2	400	330
BENZO[A]ANTHRACENE	J240	ug/Kg	1.2	400	330
CHRYSENE	<400	ug/Kg	1.2	400	330
BENZO[B]FLUORANTHENE	<400	ug/Kg	1.2	400	330
BENZO[K]FLUORANTHENE	<400	ug/Kg	1.2	400	330
BENZO[A]PYRENE	<400	ug/Kg	1.2	400	330
INDENO[1,2,3-CD]PYRENE	<400	ug/Kg	1.2	400	330
DIBENZ[A,H]ANTHRACENE	<400	ug/Kg	1.2	400	330
BENZO[G,H,I]PERYLENE	<400	ug/Kg	1.2	400	330
NITROBENZENE-D5	53	%	1.2		
2-FLUOROBIPHENYL	77	%	1.2		
TERPHENYL-D14	84	%	1.2		

Report Notes: J, E

KATAHDIN ANALYTICAL SERVICES

REPORT OF ANALYTICAL RESULTS

Client:	Paul Calligan Tetra Tech NUS 1401 Oven Park Dr. Suite 102 Tallahassee, FL 32308	**Lab Number:**	WP2792-5DL
		SDG:	WP2792
		Report Date:	8/5/99
		PO No. :	N7912-P99264
		Project:	CTO #68
Proj. ID:	CNC CHARLESTON	**% Solids:**	81
		Method:	EPA 8270
		Date Analyzed:	7/26/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25SLB130203D	SL	6/7/99	6/8/99	6/16/99	PMM	EPA 3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	88000	ug/Kg	120	40000	330
2-METHYLNAPHTHALENE	65000	ug/Kg	120	40000	330
ACENAPHTHYLENE	<40000	ug/Kg	120	40000	330
ACENAPHTHENE	<40000	ug/Kg	120	40000	330
FLUORENE	<40000	ug/Kg	120	40000	330
PHENANTHRENE	<40000	ug/Kg	120	40000	330
ANTHRACENE	<40000	ug/Kg	120	40000	330
FLUORANTHENE	<40000	ug/Kg	120	40000	330
PYRENE	<40000	ug/Kg	120	40000	330
BENZO[A]ANTHRACENE	<40000	ug/Kg	120	40000	330
CHRYSENE	<40000	ug/Kg	120	40000	330
BENZO[B]FLUORANTHENE	<40000	ug/Kg	120	40000	330
BENZO[K]FLUORANTHENE	<40000	ug/Kg	120	40000	330
BENZO[A]PYRENE	<40000	ug/Kg	120	40000	330
INDENO[1,2,3-CD]PYRENE	<40000	ug/Kg	120	40000	330
DIBENZ[A,H]ANTHRACENE	<40000	ug/Kg	120	40000	330
BENZO[G,H,I]PERYLENE	<40000	ug/Kg	120	40000	330
NITROBENZENE-D5	DL	%	120		
2-FLUOROBIPHENYL	DL	%	120		
TERPHENYL-D14	DL	%	120		

Report Notes: O-2, DL

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP2792-5
SDG: WP2792
Report Date: 8/2/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 81
Method: SW8260
Date Analyzed: 6/9/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25SLB130203D	SL	6/7/99	6/8/99	6/9/99	HMP	5035	HMP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	10000	ug/Kgdrywt	110	550	5
TOLUENE	18000	ug/Kgdrywt	110	550	5
1,2-DIBROMOETHANE	<550	ug/Kgdrywt	110	550	5
ETHYLBENZENE	E150000	ug/Kgdrywt	110	550	5
NAPHTHALENE	E74000	ug/Kgdrywt	110	550	5
MTBE	<550	ug/Kgdrywt	110	550	5
TOTAL XYLENES	220000	ug/Kgdrywt	110	550	5
DIBROMOFLUOROMETHANE	99	%	110		
1,2-DICHLOROETHANE-D4	#150	%	110		
TOLUENE-D8	88	%	110		
P-BROMOFLUOROBENZENE	106	%	110		

Report Notes: E, #

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client:	Paul Calligan Tetra Tech NUS 1401 Oven Park Dr. Suite 102 Tallahassee, FL 32308	**Lab Number:**	WP2792-5DL
		SDG:	WP2792
		Report Date:	8/2/99
		PO No. :	N7912-P99264
		Project:	CTO #68
Proj. ID:	CNC CHARLESTON	**% Solids:**	81
		Method:	SW8260
		Date Analyzed:	6/11/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25SLB130203D	SL	6/7/99	6/8/99	6/11/99	DJP	5030	DJP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<28000	ug/Kgdrywt	5600	28000	5
TOLUENE	J15000	ug/Kgdrywt	5600	28000	5
1,2-DIBROMOETHANE	<28000	ug/Kgdrywt	5600	28000	5
ETHYLBENZENE	130000	ug/Kgdrywt	5600	28000	5
NAPHTHALENE	90000	ug/Kgdrywt	5600	28000	5
MTBE	<28000	ug/Kgdrywt	5600	28000	5
TOTAL XYLENES	300000	ug/Kgdrywt	5600	28000	5
DIBROMOFLUOROMETHANE	100	%	5600		
1,2-DICHLOROETHANE-D4	90	%	5600		
TOLUENE-D8	100	%	5600		
P-BROMOFLUOROBENZENE	100	%	5600		

Report Notes: J, O-2

INORGANIC ANALYSIS DATA SHEET

Lab Name: Katahdin Analytical Services **Client Field ID:** 25SLB130203D

Matrix: SOIL **SDG Name:** WP2792

Percent Solids: 80.6 **Lab Sample ID:** WP2792-005

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

CAS No.	Analyte	Concentration	C	Q	M	DF
7439-92-1	LEAD	10.4			P	1

Color Before: BROWN Texture: MEDIUM

Color After: YELLOW Clarity After: CLEAR

Comments:

Katahdin
ANALYTICAL SERVICES

CLIENT: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

Lab Number : WP-2792-5
Report Date: 08/11/99
PO No. : N7912-P99264
Project : CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
25SLB130203D	Solid	ROGER FRANKLIN	06/07/99	06/08/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	81.	wt %	1.0	0.10	CLP/CIP SOW	06/14/99	JF	1

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.
(1) Sample Preparation on 06/11/99 by JF

08/11/99

LJO/baeajc(dw)/msm
PF11TSS7
CC: MS. LEE LECK
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Katahdin ANALYTICAL SERVICES

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP2792-6
SDG: WP2792
Report Date: 8/5/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 84
Method: EPA 8270
Date Analyzed: 7/23/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25SLB140304	SL	6/7/99	6/8/99	6/16/99	PMM	EPA 3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<400	ug/Kg	1.2	400	330
2-METHYLNAPHTHALENE	<400	ug/Kg	1.2	400	330
ACENAPHTHYLENE	<400	ug/Kg	1.2	400	330
ACENAPHTHENE	<400	ug/Kg	1.2	400	330
FLUORENE	<400	ug/Kg	1.2	400	330
PHENANTHRENE	<400	ug/Kg	1.2	400	330
ANTHRACENE	<400	ug/Kg	1.2	400	330
FLUORANTHENE	<400	ug/Kg	1.2	400	330
PYRENE	<400	ug/Kg	1.2	400	330
BENZO[A]ANTHRACENE	<400	ug/Kg	1.2	400	330
CHRYSENE	<400	ug/Kg	1.2	400	330
BENZO[B]FLUORANTHENE	<400	ug/Kg	1.2	400	330
BENZO[K]FLUORANTHENE	<400	ug/Kg	1.2	400	330
BENZO[A]PYRENE	<400	ug/Kg	1.2	400	330
INDENO[1,2,3-CD]PYRENE	<400	ug/Kg	1.2	400	330
DIBENZ[A,H]ANTHRACENE	<400	ug/Kg	1.2	400	330
BENZO[G,H,I]PERYLENE	<400	ug/Kg	1.2	400	330
NITROBENZENE-D5	57	%	1.2		
2-FLUOROBIPHENYL	63	%	1.2		
TERPHENYL-D14	91	%	1.2		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client:	Paul Calligan Tetra Tech NUS 1401 Oven Park Dr. Suite 102 Tallahassee, FL 32308	**Lab Number:**	WP2792-6
		SDG:	WP2792
		Report Date:	8/2/99
		PO No. :	N7912-P99264
		Project:	CTO #68
Proj. ID:	CNC CHARLESTON	**% Solids:**	84
		Method:	SW8260
		Date Analyzed:	6/11/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25SLB140304	SL	6/7/99	6/8/99	6/11/99	DJP	5030	DJP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/Kg	0.98	5	5
TOLUENE	12	ug/Kg	0.98	5	5
1,2-DIBROMOETHANE	<5	ug/Kg	0.98	5	5
ETHYLBENZENE	13	ug/Kg	0.98	5	5
NAPHTHALENE	60	ug/Kg	0.98	5	5
MTBE	<5	ug/Kg	0.98	5	5
TOTAL XYLENES	12	ug/Kg	0.98	5	5
DIBROMOFLUOROMETHANE	119	%	0.98		
1,2-DICHLOROETHANE-D4	#182	%	0.98		
TOLUENE-D8	96	%	0.98		
P-BROMOFLUOROBENZENE	100	%	0.98		

Report Notes: #

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Katahdin Analytical Services

Client:	Paul Calligan Tetra Tech NUS 1401 Oven Park Dr. Suite 102 Tallahassee, FL 32308	**Lab Number:**	WP2972-6RE
		SDG:	WP2792
		Report Date:	8/2/99
		PO No. :	N7912-P99264
		Project:	CTO #68
Proj. ID:	CNC CHARLESTON	**% Solids:**	-
		Method:	SW8260
		Date Analyzed:	6/11/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25SLB140304	SL	6/7/99	6/8/99	6/11/99	DJP	5030	DJP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	7	ug/Kg	1.1	6	5
TOLUENE	<6	ug/Kg	1.1	6	5
1,2-DIBROMOETHANE	<6	ug/Kg	1.1	6	5
ETHYLBENZENE	6	ug/Kg	1.1	6	5
NAPHTHALENE	J4	ug/Kg	1.1	6	5
MTBE	<6	ug/Kg	1.1	6	5
TOTAL XYLENES	J5	ug/Kg	1.1	6	5
DIBROMOFLUOROMETHANE	114	%	1.1		
1,2-DICHLOROETHANE-D4	118	%	1.1		
TOLUENE-D8	103	%	1.1		
P-BROMOFLUOROBENZENE	124	%	1.1		

Report Notes: J, O-13

INORGANIC ANALYSIS DATA SHEET

Lab Name: Katahdin Analytical Services
Client Field ID: 25SLB140304

Matrix: SOIL
SDG Name: WP2792

Percent Solids: 84.4
Lab Sample ID: WP2792-006

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

CAS No.	Analyte	Concentration	C	Q	M	DF
7439-92-1	LEAD	4.9			P	1

Color Before: BROWN
Texture: MEDIUM

Color After: YELLOW
Clarity After: CLEAR

Comments:

ANALYTICAL SERVICES

CLIENT: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

Lab Number : WP-2792-6
Report Date: 08/11/99
PO No. : N7912-P99264
Project : CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
25SLB140304	Solid	ROGER FRANKLIN	06/07/99	06/08/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	84.	wt %	1.0	0.10	CLP/CIP SOW	06/14/99	JF	1

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.
(1) Sample Preparation on 06/11/99 by JF

08/11/99

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CC: MS. LEE LECK
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Katahdin ANALYTICAL SERVICES

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP2792-7
SDG: WP2792
Report Date: 8/5/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 85
Method: EPA 8270
Date Analyzed: 7/23/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25SLB160304	SL	6/7/99	6/8/99	6/16/99	PMM	EPA 3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<400	ug/Kg	1.2	400	330
2-METHYLNAPHTHALENE	<400	ug/Kg	1.2	400	330
ACENAPHTHYLENE	<400	ug/Kg	1.2	400	330
ACENAPHTHENE	<400	ug/Kg	1.2	400	330
FLUORENE	<400	ug/Kg	1.2	400	330
PHENANTHRENE	<400	ug/Kg	1.2	400	330
ANTHRACENE	<400	ug/Kg	1.2	400	330
FLUORANTHENE	<400	ug/Kg	1.2	400	330
PYRENE	<400	ug/Kg	1.2	400	330
BENZO[A]ANTHRACENE	<400	ug/Kg	1.2	400	330
CHRYSENE	<400	ug/Kg	1.2	400	330
BENZO[B]FLUORANTHENE	<400	ug/Kg	1.2	400	330
BENZO[K]FLUORANTHENE	<400	ug/Kg	1.2	400	330
BENZO[A]PYRENE	<400	ug/Kg	1.2	400	330
INDENO[1,2,3-CD]PYRENE	<400	ug/Kg	1.2	400	330
DIBENZ[A,H]ANTHRACENE	<400	ug/Kg	1.2	400	330
BENZO[G,H,I]PERYLENE	<400	ug/Kg	1.2	400	330
NITROBENZENE-D5	56	%	1.2		
2-FLUOROBIPHENYL	57	%	1.2		
TERPHENYL-D14	83	%	1.2		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client:	Paul Calligan Tetra Tech NUS 1401 Oven Park Dr. Suite 102 Tallahassee, FL 32308	**Lab Number:**	WP2792-7
		SDG:	WP2792
		Report Date:	8/2/99
		PO No. :	N7912-P99264
		Project:	CTO #68
Proj. ID:	CNC CHARLESTON	**% Solids:**	85
		Method:	SW8260
		Date Analyzed:	6/16/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25SLB160304	SL	6/7/99	6/8/99	6/16/99	KRT	5030	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	8	ug/Kg	1.0	5	5
TOLUENE	<5	ug/Kg	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/Kg	1.0	5	5
ETHYLBENZENE	<5	ug/Kg	1.0	5	5
NAPHTHALENE	J4	ug/Kg	1.0	5	5
MTBE	<5	ug/Kg	1.0	5	5
TOTAL XYLENES	<5	ug/Kg	1.0	5	5
DIBROMOFLUOROMETHANE	115	%	1.0		
1,2-DICHLOROETHANE-D4	118	%	1.0		
TOLUENE-D8	125	%	1.0		
P-BROMOFLUOROBENZENE	103	%	1.0		

Report Notes: J

INORGANIC ANALYSIS DATA SHEET

Lab Name: Katahdin Analytical Services **Client Field ID:** 25SLB160304

Matrix: SOIL **SDG Name:** WP2792

Percent Solids: 85.3 **Lab Sample ID:** WP2792-007

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

CAS No.	Analyte	Concentration	C	Q	M	DF
7439-92-1	LEAD	6.5			P	1

Color Before: BROWN Texture: FINE

Color After: YELLOW Clarity After: CLEAR

Comments:

Katahdin
ANALYTICAL SERVICES

CLIENT: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

Lab Number : WP-2792-7
Report Date: 08/11/99
PO No. : N7912-P99264
Project : CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
25SLB160304	Solid	ROGER FRANKLIN	06/07/99	06/08/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	85.	wt %	1.0	0.10	CLP/CIP SOW	06/14/99	JF	1

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.
(1) Sample Preparation on 06/11/99 by JF

08/11/99

LJO/baeajc(dw)/msm
PF11TSS7
CC: MS. LEE LECK
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FOSTER PALZA 7
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KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client:	Paul Calligan Tetra Tech NUS 1401 Oven Park Dr. Suite 102 Tallahassee, FL 32308	**Lab Number:**	WP2792-8
		SDG:	WP2792
		Report Date:	8/5/99
		PO No. :	N7912-P99264
		Project:	CTO #68
Proj. ID:	CNC CHARLESTON	**% Solids:**	84
		Method:	EPA 8270
		Date Analyzed:	7/23/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25SLB170304	SL	6/7/99	6/8/99	6/16/99	PMM	EPA 3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	2600	ug/Kg	1.2	400	330
2-METHYLNAPHTHALENE	2000	ug/Kg	1.2	400	330
ACENAPHTHYLENE	<400	ug/Kg	1.2	400	330
ACENAPHTHENE	<400	ug/Kg	1.2	400	330
FLUORENE	<400	ug/Kg	1.2	400	330
PHENANTHRENE	<400	ug/Kg	1.2	400	330
ANTHRACENE	<400	ug/Kg	1.2	400	330
FLUORANTHENE	<400	ug/Kg	1.2	400	330
PYRENE	<400	ug/Kg	1.2	400	330
BENZO[A]ANTHRACENE	<400	ug/Kg	1.2	400	330
CHRYSENE	<400	ug/Kg	1.2	400	330
BENZO[B]FLUORANTHENE	<400	ug/Kg	1.2	400	330
BENZO[K]FLUORANTHENE	<400	ug/Kg	1.2	400	330
BENZO[A]PYRENE	<400	ug/Kg	1.2	400	330
INDENO[1,2,3-CD]PYRENE	<400	ug/Kg	1.2	400	330
DIBENZ[A,H]ANTHRACENE	<400	ug/Kg	1.2	400	330
BENZO[G,H,I]PERYLENE	<400	ug/Kg	1.2	400	330
NITROBENZENE-D5	55	%	1.2		
2-FLUOROBIPHENYL	65	%	1.2		
TERPHENYL-D14	82	%	1.2		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP2792-8
SDG: WP2792
Report Date: 8/2/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 84
Method: SW8260
Date Analyzed: 6/11/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25SLB170304	SL	6/7/99	6/8/99	6/11/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	E24000	ug/Kgdrywt	110	550	5
TOLUENE	E85000	ug/Kgdrywt	110	550	5
1,2-DIBROMOETHANE	<550	ug/Kgdrywt	110	550	5
ETHYLBENZENE	E37000	ug/Kgdrywt	110	550	5
NAPHTHALENE	16000	ug/Kgdrywt	110	550	5
MTBE	4300	ug/Kgdrywt	110	550	5
TOTAL XYLENES	180000	ug/Kgdrywt	110	550	5
DIBROMOFLUOROMETHANE	101	%	110		
1,2-DICHLOROETHANE-D4	132	%	110		
TOLUENE-D8	101	%	110		
P-BROMOFLUOROBENZENE	96	%	110		

Report Notes: E

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP2792-8DL
SDG: WP2792
Report Date: 8/2/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 84
Method: SW8260
Date Analyzed: 6/15/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25SLB170304	SL	6/7/99	6/8/99	6/15/99	DJP	5030	DJP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	32000	ug/Kgdrywt	2300	12000	5
TOLUENE	240000	ug/Kgdrywt	2300	12000	5
1,2-DIBROMOETHANE	<12000	ug/Kgdrywt	2300	12000	5
ETHYLBENZENE	49000	ug/Kgdrywt	2300	12000	5
NAPHTHALENE	14000	ug/Kgdrywt	2300	12000	5
MTBE	<12000	ug/Kgdrywt	2300	12000	5
TOTAL XYLENES	250000	ug/Kgdrywt	2300	12000	5
DIBROMOFLUOROMETHANE	96	%	2300		
1,2-DICHLOROETHANE-D4	94	%	2300		
TOLUENE-D8	109	%	2300		
P-BROMOFLUOROBENZENE	104	%	2300		

Report Notes: O-2

INORGANIC ANALYSIS DATA SHEET

Lab Name: Katahdin Analytical Services | **Client Field ID:** 25SLB170304

Matrix: SOIL | **SDG Name:** WP2792

Percent Solids: 83.8 | **Lab Sample ID:** WP2792-008

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

CAS No.	Analyte	Concentration	C	Q	M	DF
7439-92-1	LEAD	7.4			P	1

Color Before: BROWN Texture: FINE

Color After: YELLOW Clarity After: CLEAR

Comments:

Katahdin
ANALYTICAL SERVICES

CLIENT: Paul Calligan Tetra Tech NUS 1401 Oven Park Dr., Suite 102 Tallahassee, FL 32308	Lab Number : WP-2792-8 Report Date: 08/11/99 PO No. : N7912-P99264 Project : CTO #68

WIC#: CNC CHARLESTON REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
25SLB170304	Solid	ROGER FRANKLIN	06/07/99	06/08/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	84.	wt %	1.0	0.10	CLP/CIP SOW	06/14/99	JF	1

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.
(1) Sample Preparation on 06/11/99 by JF

08/11/99

LJO/baeajc(dw)/msm
PF11TSS7
CC: MS. LEE LECK
TETRA TECH NUS
FOSTER PALZA 7
661 ANDERSEN DR.

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP2792-9
SDG: WP2792
Report Date: 8/5/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 76
Method: EPA 8270
Date Analyzed: 7/23/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25SLB120203	SL	6/7/99	6/8/99	6/16/99	PMM	EPA 3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	E10000	ug/Kg	1.3	430	330
2-METHYLNAPHTHALENE	E7400	ug/Kg	1.3	430	330
ACENAPHTHYLENE	<430	ug/Kg	1.3	430	330
ACENAPHTHENE	<430	ug/Kg	1.3	430	330
FLUORENE	<430	ug/Kg	1.3	430	330
PHENANTHRENE	540	ug/Kg	1.3	430	330
ANTHRACENE	<430	ug/Kg	1.3	430	330
FLUORANTHENE	<430	ug/Kg	1.3	430	330
PYRENE	J240	ug/Kg	1.3	430	330
BENZO[A]ANTHRACENE	<430	ug/Kg	1.3	430	330
CHRYSENE	<430	ug/Kg	1.3	430	330
BENZO[B]FLUORANTHENE	<430	ug/Kg	1.3	430	330
BENZO[K]FLUORANTHENE	<430	ug/Kg	1.3	430	330
BENZO[A]PYRENE	<430	ug/Kg	1.3	430	330
INDENO[1,2,3-CD]PYRENE	<430	ug/Kg	1.3	430	330
DIBENZ[A,H]ANTHRACENE	<430	ug/Kg	1.3	430	330
BENZO[G,H,I]PERYLENE	<430	ug/Kg	1.3	430	330
NITROBENZENE-D5	50	%	1.3		
2-FLUOROBIPHENYL	63	%	1.3		
TERPHENYL-D14	80	%	1.3		

Report Notes: J, E

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP2792-9DL
SDG: WP2792
Report Date: 8/5/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 76
Method: EPA 8270
Date Analyzed: 7/26/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25SLB120203	SL	6/7/99	6/8/99	6/16/99	PMM	EPA 3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	11000	ug/Kg	6.6	2200	330
2-METHYLNAPHTHALENE	7900	ug/Kg	6.6	2200	330
ACENAPHTHYLENE	<2200	ug/Kg	6.6	2200	330
ACENAPHTHENE	<2200	ug/Kg	6.6	2200	330
FLUORENE	<2200	ug/Kg	6.6	2200	330
PHENANTHRENE	<2200	ug/Kg	6.6	2200	330
ANTHRACENE	<2200	ug/Kg	6.6	2200	330
FLUORANTHENE	<2200	ug/Kg	6.6	2200	330
PYRENE	<2200	ug/Kg	6.6	2200	330
BENZO[A]ANTHRACENE	<2200	ug/Kg	6.6	2200	330
CHRYSENE	<2200	ug/Kg	6.6	2200	330
BENZO[B]FLUORANTHENE	<2200	ug/Kg	6.6	2200	330
BENZO[K]FLUORANTHENE	<2200	ug/Kg	6.6	2200	330
BENZO[A]PYRENE	<2200	ug/Kg	6.6	2200	330
INDENO[1,2,3-CD]PYRENE	<2200	ug/Kg	6.6	2200	330
DIBENZ[A,H]ANTHRACENE	<2200	ug/Kg	6.6	2200	330
BENZO[G,H,I]PERYLENE	<2200	ug/Kg	6.6	2200	330
NITROBENZENE-D5	41	%	6.6		
2-FLUOROBIPHENYL	59	%	6.6		
TERPHENYL-D14	74	%	6.6		

Report Notes: O-2

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Katahdin Analytical Services

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP2792-9
SDG: WP2792
Report Date: 8/2/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 76
Method: SW8260
Date Analyzed: 6/9/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25SLB120203	SL	6/7/99	6/8/99	6/9/99	HMP	5035	HMP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	E100000	ug/Kgdrywt	150	750	5
TOLUENE	E320000	ug/Kgdrywt	150	750	5
1,2-DIBROMOETHANE	<750	ug/Kgdrywt	150	750	5
ETHYLBENZENE	E380000	ug/Kgdrywt	150	750	5
NAPHTHALENE	E160000	ug/Kgdrywt	150	750	5
MTBE	<750	ug/Kgdrywt	150	750	5
TOTAL XYLENES	740000	ug/Kgdrywt	150	750	5
DIBROMOFLUOROMETHANE	93	%	150		
1,2-DICHLOROETHANE-D4	#251	%	150		
TOLUENE-D8	101	%	150		
P-BROMOFLUOROBENZENE	#127	%	150		

Report Notes: E, #

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP2792-9DL
SDG: WP2792
Report Date: 8/2/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 76
Method: SW8260
Date Analyzed: 6/11/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25SLB120203	SL	6/7/99	6/8/99	6/11/99	DJP	5030	DJP

Compound	Result	Units	BF	Sample PQL	Method PQL
BENZENE	120000	ug/Kgdrywt	15000	75000	5
TOLUENE	360000	ug/Kgdrywt	15000	75000	5
1,2-DIBROMOETHANE	<75000	ug/Kgdrywt	15000	75000	5
ETHYLBENZENE	560000	ug/Kgdrywt	15000	75000	5
NAPHTHALENE	210000	ug/Kgdrywt	15000	75000	5
MTBE	<75000	ug/Kgdrywt	15000	75000	5
TOTAL XYLENES	2200000	ug/Kgdrywt	15000	75000	5
DIBROMOFLUOROMETHANE	102	%	15000		
1,2-DICHLOROETHANE-D4	91	%	15000		
TOLUENE-D8	101	%	15000		
P-BROMOFLUOROBENZENE	101	%	15000		

Report Notes: O-2

INORGANIC ANALYSIS DATA SHEET

Lab Name: Katahdin Analytical Services

Client Field ID: 25SLB120203

Matrix: SOIL

SDG Name: WP2792

Percent Solids: 76.0

Lab Sample ID: WP2792-009

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

CAS No.	Analyte	Concentration	C	Q	M	DF
7439-92-1	LEAD	26.2			P	1

Color Before: BROWN

Texture: MEDIUM

Color After: YELLOW

Clarity After: CLEAR

Comments:

FORM I - IN

Katahdin
ANALYTICAL SERVICES

	Lab Number : WP-2792-9
CLIENT: Paul Calligan	Report Date: 08/11/99
Tetra Tech NUS	PO No. : N7912-P99264
1401 Oven Park Dr., Suite 102	Project : CTO #68
Tallahassee, FL 32308	

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
25SLB120203	Solid	ROGER FRANKLIN	06/07/99	06/08/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	76.	wt %	1.0	0.10	CLP/CIP SOW	06/14/99	JF	1

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.
(1) Sample Preparation on 06/11/99 by JF

08/11/99

LJO/baeajc(dw)/msm
PF11TSS7
CC: MS. LEE LECK
TETRA TECH NUS
FOSTER PALZA 7
661 ANDERSEN DR.

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP2792-11
SDG: WP2792
Report Date: 8/2/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: -
Method: SW8260
Date Analyzed: 6/10/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25TL00501	SL	6/7/99	6/8/99	6/10/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/Kgdrywt	1.0	5	5
TOLUENE	<5	ug/Kgdrywt	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/Kgdrywt	1.0	5	5
ETHYLBENZENE	<5	ug/Kgdrywt	1.0	5	5
NAPHTHALENE	<5	ug/Kgdrywt	1.0	5	5
MTBE	<5	ug/Kgdrywt	1.0	5	5
TOTAL XYLENES	<5	ug/Kgdrywt	1.0	5	5
DIBROMOFLUOROMETHANE	104	%	1.0		
1,2-DICHLOROETHANE-D4	101	%	1.0		
TOLUENE-D8	108	%	1.0		
P-BROMOFLUOROBENZENE	99	%	1.0		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP2792-12
SDG: WP2792
Report Date: 8/5/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 92
Method: EPA 8270
Date Analyzed: 7/23/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25SLB150304	SL	6/7/99	6/8/99	6/16/99	PMM	EPA 3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<360	ug/Kg	1.1	360	330
2-METHYLNAPHTHALENE	<360	ug/Kg	1.1	360	330
ACENAPHTHYLENE	<360	ug/Kg	1.1	360	330
ACENAPHTHENE	<360	ug/Kg	1.1	360	330
FLUORENE	<360	ug/Kg	1.1	360	330
PHENANTHRENE	<360	ug/Kg	1.1	360	330
ANTHRACENE	<360	ug/Kg	1.1	360	330
FLUORANTHENE	<360	ug/Kg	1.1	360	330
PYRENE	<360	ug/Kg	1.1	360	330
BENZO[A]ANTHRACENE	<360	ug/Kg	1.1	360	330
CHRYSENE	<360	ug/Kg	1.1	360	330
BENZO[B]FLUORANTHENE	<360	ug/Kg	1.1	360	330
BENZO[K]FLUORANTHENE	<360	ug/Kg	1.1	360	330
BENZO[A]PYRENE	<360	ug/Kg	1.1	360	330
INDENO[1,2,3-CD]PYRENE	<360	ug/Kg	1.1	360	330
DIBENZ[A,H]ANTHRACENE	<360	ug/Kg	1.1	360	330
BENZO[G,H,I]PERYLENE	<360	ug/Kg	1.1	360	330
NITROBENZENE-D5	46	%	1.1		
2-FLUOROBIPHENYL	56	%	1.1		
TERPHENYL-D14	77	%	1.1		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: WP2792-12
SDG: WP2792
Report Date: 8/2/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 92
Method: SW8260
Date Analyzed: 6/11/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
25SLB150304	SL	6/7/99	6/8/99	6/11/99	DJP	5030	DJP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<6	ug/Kg	1.2	6	5
TOLUENE	<6	ug/Kg	1.2	6	5
1,2-DIBROMOETHANE	<6	ug/Kg	1.2	6	5
ETHYLBENZENE	<6	ug/Kg	1.2	6	5
NAPHTHALENE	<6	ug/Kg	1.2	6	5
MTBE	<6	ug/Kg	1.2	6	5
TOTAL XYLENES	<6	ug/Kg	1.2	6	5
DIBROMOFLUOROMETHANE	121	%	1.2		
1,2-DICHLOROETHANE-D4	118	%	1.2		
TOLUENE-D8	112	%	1.2		
P-BROMOFLUOROBENZENE	87	%	1.2		

Report Notes:

INORGANIC ANALYSIS DATA SHEET

Lab Name: Katahdin Analytical Services

Client Field ID: 25SLB150304

Matrix: SOIL

SDG Name: WP2792

Percent Solids: 91.7

Lab Sample ID: WP2792-012

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

CAS No.	Analyte	Concentration	C	Q	M	DF
7439-92-1	LEAD	5.9			P	1

Color Before: BROWN

Texture: COARSE

Color After: YELLOW

Clarity After: CLEAR

Comments:

Katahdin
ANALYTICAL SERVICES

Lab Number : WP-2792-12
Report Date: 08/11/99
PO No. : N7912-P99264
Project : CTO #68

CLIENT: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr., Suite 102
Tallahassee, FL 32308

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
25SLB150304	Solid	ROGER FRANKLIN	06/07/99	06/08/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	91.	wt %	1.0	0.10	CLP/CIP SOW	06/14/99	JF	1
Total Combustible Organics	1.4	wt %	1.0	0.1	ASTM D2974-8	06/14/99	JF	1

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.
(1) Sample Preparation on 06/11/99 by JF

08/11/99

LJO/baeajc(dw)/msm
PF11VSS8
CC: MS. LEE LECK
TETRA TECH NUS
FOSTER PALZA 7
661 ANDERSEN DR.

2A

SOIL SEMIVOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: Katahdin Analytical Services SDG No.: WP2792

Matrix: SOIL

Client Sample ID	Lab Sample ID	SMC1 (NBZ) #	SMC2 (FBP) #	SMC3 (TPH) #	Total Out
SBLK;061599	SBLK;061599	70	71	88	0
25SLB090304	WP2792-1	42	48	86	0
25SLB140304	WP2792-6	57	63	91	0
25SLB160304	WP2792-7	56	57	83	0
25SLB170304	WP2792-8	55	65	82	0
25SLB150304	WP2792-12	46	56	77	0
25SLB100102	WP2792-2	49	57	75	0
25SLB110203	WP2792-3	53	60	81	0
25SLB130203	WP2792-4	47	71	75	0
25SLB130203D	WP2792-5	53	77	84	0
25SLB120203	WP2792-9	50	63	80	0
LCS;061699	LCS;061699	71	80	86	0
25SLB130203DL	WP2792-4DL	37	63	60	0
25SLB130203DDL	WP2792-5DL	0*	74	39	1
25SLB120203DL	WP2792-9DL	41	59	74	0

QC LIMITS

SMC1	(NBZ)	=	NITROBENZENE-D5	(14-107)
SMC2	(FBP)	=	2-FLUOROBIPHENYL	(32-109)
SMC3	(TPH)	=	TERPHENYL-D14	(26-116)

Column to be used to flag recovery value

* Values are outside of QC limits

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: SBLK;061599
SDG: WP2792
Report Date: 8/5/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 100
Method: EPA 8270
Date Analyzed: 7/23/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
SBLK;061599	SL	-	-	6/15/99	PMM	EPA 3550	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
NAPHTHALENE	<330	ug/Kg	1.0	330	330
2-METHYLNAPHTHALENE	<330	ug/Kg	1.0	330	330
ACENAPHTHYLENE	<330	ug/Kg	1.0	330	330
ACENAPHTHENE	<330	ug/Kg	1.0	330	330
FLUORENE	<330	ug/Kg	1.0	330	330
PHENANTHRENE	<330	ug/Kg	1.0	330	330
ANTHRACENE	<330	ug/Kg	1.0	330	330
FLUORANTHENE	<330	ug/Kg	1.0	330	330
PYRENE	<330	ug/Kg	1.0	330	330
BENZO[A]ANTHRACENE	<330	ug/Kg	1.0	330	330
CHRYSENE	<330	ug/Kg	1.0	330	330
BENZO[B]FLUORANTHENE	<330	ug/Kg	1.0	330	330
BENZO[K]FLUORANTHENE	<330	ug/Kg	1.0	330	330
BENZO[A]PYRENE	<330	ug/Kg	1.0	330	330
INDENO[1,2,3-CD]PYRENE	<330	ug/Kg	1.0	330	330
DIBENZ[A,H]ANTHRACENE	<330	ug/Kg	1.0	330	330
BENZO[G,H,I]PERYLENE	<330	ug/Kg	1.0	330	330
NITROBENZENE-D5	70	%	1.0		
2-FLUOROBIPHENYL	71	%	1.0		
TERPHENYL-D14	88	%	1.0		

Report Notes:

Katahdin Analytical Services
8270 LCS Recovery Sheet

Lab File: I3932 **Sample ID:** LCS;061699 **Date Run:** 7/26/99

Analyst: KRT **Time Injected** 9:35:00 AM **Matrix:** SL

Compound Name	Spike Amt (ug/Kg)	Result (ug/Kg)	Rec (%)	Limits (%)
2-METHYLNAPHTHALENE	1667	1460	88	60-140
ACENAPHTHENE	1667	1220	73	60-140
ACENAPHTHYLENE	1667	1220	73	60-140
ANTHRACENE	1667	1220	73	60-140
BENZO[A]ANTHRACENE	1667	1240	74	60-140
BENZO[A]PYRENE	1667	1200	72	60-140
BENZO[B]FLUORANTHENE	1667	1320	79	60-140
BENZO[G,H,I]PERYLENE	1667	1320	79	60-140
BENZO[K]FLUORANTHENE	1667	1320	79	60-140
CHRYSENE	1667	1410	84	60-140
DIBENZ[A,H]ANTHRACENE	1667	1210	72	60-140
FLUORANTHENE	1667	1220	73	60-140
FLUORENE	1667	1220	73	60-140
INDENO[1,2,3-CD]PYRENE	1667	1320	79	60-140
NAPHTHALENE	1667	1210	73	60-140
PHENANTHRENE	1667	1340	80	60-140
PYRENE	1667	1370	82	60-140

* Out of Limits

2A

WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: Katahdin Analytical Services

SDG No.: WP2792

Matrix: WATER

Client Sample ID	Lab Sample ID	SMC1 (DFM) #	SMC2 (DCA) #	SMC3 (TOL) #	SMC4 (BFB) #	Total Out
LCSF10A	LCSF10A	93	87	103	106	0
VBLKF10A	VBLKF10A	94	87	103	98	0
LCSF11A	LCSF11A	102	86	101	103	0
VBLKF11B	VBLKF11B	97	86	101	98	0
LCSF14A	LCSF14A	98	80	103	101	0
VBLKF14A	VBLKF14A	98	84	102	96	0
LCSF15A	LCSF15A	96	87	107	106	0
VBLKF15B	VBLKF15B	94	93	106	96	0
LCSM10A	LCSM10A	102	94	105	99	0
VBLKM10B	VBLKM10B	104	96	108	98	0
LCSQ09A	LCSQ09A	86	84	88	84	0
VBLKQ09A	VBLKQ09A	83	81	90	88	0

QC LIMITS

SMC1	(DFM)	=	DIBROMOFLUOROMETHANE	(75-129)
SMC2	(DCA)	=	1,2-DICHLOROETHANE-D4	(65-135)
SMC3	(TOL)	=	TOLUENE-D8	(82-120)
SMC4	(BFB)	=	P-BROMOFLUOROBENZENE	(69-125)

Column to be used to flag recovery value

* Values are outside of QC limits

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: VBLKF10A
SDG: WP2792
Report Date: 8/2/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 6/10/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKF10A	AQ	-	-	6/10/99	DJP	5030	DJP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	94	%	1.0		
1,2-DICHLOROETHANE-D4	87	%	1.0		
TOLUENE-D8	103	%	1.0		
P-BROMOFLUOROBENZENE	98	%	1.0		

Report Notes:

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: F0891 **Sample ID:** LCSF10A **Date Run:** 6/10/99

Analyst: DJP **Time Injected** 8:12:00 PM **Matrix:** AQ

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	55.7	111	60-140
BENZENE	50	54.0	108	60-140
ETHYLBENZENE	50	54.4	109	60-140
MTBE	50	50.7	101	60-140
NAPHTHALENE	50	50.9	102	60-140
TOLUENE	50	55.4	111	60-140
TOTAL XYLENES	150	162	108	60-140

* Out of Limits

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: VBLKF11B
SDG: WP2792
Report Date: 8/2/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 6/11/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKF11B	AQ	-	-	6/11/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	97	%	1.0		
1,2-DICHLOROETHANE-D4	86	%	1.0		
TOLUENE-D8	101	%	1.0		
P-BROMOFLUOROBENZENE	98	%	1.0		

Report Notes:

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: F0909 **Sample ID:** LCSF11A **Date Run:** 6/11/99

Analyst: JSS **Time Injected** 11:39:00 AM **Matrix:** AQ

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	51.1	102	60-140
BENZENE	50	54.0	108	60-140
ETHYLBENZENE	50	53.0	106	60-140
MTBE	50	51.8	104	60-140
NAPHTHALENE	50	50.9	102	60-140
TOLUENE	50	54.6	109	60-140
TOTAL XYLENES	150	157	105	60-140

* Out of Limits 1

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: F0944 **Sample ID:** LCSF14A **Date Run:** 6/14/99

Analyst: DJP **Time Injected** 11:07:00 AM **Matrix:** AQ

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	49.4	99	60-140
BENZENE	50	51.5	103	60-140
ETHYLBENZENE	50	51.9	104	60-140
MTBE	50	46.8	94	60-140
NAPHTHALENE	50	49.9	100	60-140
TOLUENE	50	53.1	106	60-140
TOTAL XYLENES	150	156	104	60-140

* Out of Limits

Katahdin ANALYTICAL SERVICES

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: VBLKF15B
SDG: WP2792
Report Date: 8/2/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 6/15/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKF15B	AQ	-	-	6/15/99	DJP	5030	DJP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	94	%	1.0		
1,2-DICHLOROETHANE-D4	93	%	1.0		
TOLUENE-D8	106	%	1.0		
P-BROMOFLUOROBENZENE	96	%	1.0		

Report Notes:

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: F0977 **Sample ID:** LCSF15A **Date Run:** 6/15/99

Analyst: DJP **Time Injected** 9:26:00 AM **Matrix:** AQ

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	51.1	102	60-140
BENZENE	50	54.7	109	60-140
ETHYLBENZENE	50	55.0	110	60-140
MTBE	50	49.4	99	60-140
NAPHTHALENE	50	49.3	98	60-140
TOLUENE	50	56.0	112	60-140
TOTAL XYLENES	150	162	108	60-140

* Out of Limits

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: VBLKM10B
SDG: WP2792
Report Date: 8/2/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 6/10/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKM10B	AQ	-	-	6/10/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	104	%	1.0		
1,2-DICHLOROETHANE-D4	96	%	1.0		
TOLUENE-D8	108	%	1.0		
P-BROMOFLUOROBENZENE	98	%	1.0		

Report Notes:

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: M0599 **Sample ID:** LCSM10A **Date Run:** 6/10/99

Analyst: JSS **Time Injected** 9:52:00 AM **Matrix:** AQ

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	44.2	88	60-140
BENZENE	50	51.5	103	60-140
ETHYLBENZENE	50	51.0	102	60-140
MTBE	50	45.3	91	60-140
NAPHTHALENE	50	45.7	91	60-140
TOLUENE	50	51.6	103	60-140
TOTAL XYLENES	150	149	99	60-140

* Out of Limits

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: VBLKQ09A
SDG: WP2792
Report Date: 8/2/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: N/A
Method: SW8260
Date Analyzed: 6/9/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKQ09A	AQ	-	-	6/9/99	HMP	5030	HMP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/L	1.0	5	5
TOLUENE	<5	ug/L	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5
ETHYLBENZENE	<5	ug/L	1.0	5	5
NAPHTHALENE	<5	ug/L	1.0	5	5
MTBE	<5	ug/L	1.0	5	5
TOTAL XYLENES	<5	ug/L	1.0	5	5
DIBROMOFLUOROMETHANE	83	%	1.0		
1,2-DICHLOROETHANE-D4	81	%	1.0		
TOLUENE-D8	90	%	1.0		
P-BROMOFLUOROBENZENE	88	%	1.0		

Report Notes:

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: Q5423 **Sample ID:** LCSQ09A **Date Run:** 6/9/99

Analyst: HMP **Time Injected** 11:36:00 AM **Matrix:** AQ

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	48.7	97	60-140
BENZENE	50	49.6	99	60-140
ETHYLBENZENE	50	57.1	114	60-140
MTBE	50	43.1	86	60-140
NAPHTHALENE	50	48.0	96	60-140
TOLUENE	50	50.4	101	60-140
TOTAL XYLENES	150	149	99	60-140

* Out of Limits

2A

SOIL VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: Katahdin Analytical Services

SDG No.: WP2792

Matrix: SOIL

Client Sample ID	Lab Sample ID	SMC1 (DFM) #	SMC2 (DCA) #	SMC3 (TOL) #	SMC4 (BFB) #	Total Out
MBLK061099	MBLK061099	92	86	102	95	0
25SLB130203DL	WP2792-4DL	92	87	103	104	0
25SLB130203DDL	WP2792-5DL	100	90	100	100	0
25SLB120203DL	WP2792-9DL	102	91	101	101	0
25SLB100102	WP2792-2	92	104	108	120	0
25SLB170304	WP2792-8	101	132	101	96	0
25SLB100102DL	WP2792-2DL	95	96	106	109	0
25SLB170304DL	WP2792-8DL	96	94	109	104	0
25TL00501	WP2792-11	104	101	108	99	0
25SLB130203	WP2792-4	88	106	89	98	0
25SLB130203D	WP2792-5	99	150*	88	106	1
25SLB120203	WP2792-9	93	251*	101	127	1
LCSZ11A	LCSZ11A	100	100	100	95	0
VBLKZ11B	VBLKZ11B	130	126	119	88	0
25SLB110203	WP2792-3	82	92	94	88	0
25SLB140304	WP2792-6	119	182*	96	100	1
25SLB150304	WP2792-12	121	118	112	87	0
25SLB140304RE	WP2972-6RE	114	118	103	124	0
LCSZ16A	LCSZ16A	101	112	107	103	0
VBLKZ16B	VBLKZ16B	125	127	120	105	0
25SLB090304	WP2792-1	88	92	86	72	0
25SLB160304	WP2792-7	115	118	125	103	0

QC LIMITS

SMC1	(DFM)	=	DIBROMOFLUOROMETHANE	(69-148)
SMC2	(DCA)	=	1,2-DICHLOROETHANE-D4	(66-149)
SMC3	(TOL)	=	TOLUENE-D8	(68-147)
SMC4	(BFB)	=	P-BROMOFLUOROBENZENE	(64-152)

Column to be used to flag recovery value

* Values are outside of QC limits

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client:	Paul Calligan Tetra Tech NUS 1401 Oven Park Dr. Suite 102 Tallahassee, FL 32308	**Lab Number:**	MBLK061099
		SDG:	WP2792
		Report Date:	8/2/99
		PO No. :	N7912-P99264
		Project:	CTO #68
Proj. ID:	CNC CHARLESTON	**% Solids:**	100
		Method:	SW8260
		Date Analyzed:	6/10/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
MBLK061099	SL	-	-	6/10/99	DJP	5030	DJP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<600	ug/Kgdrywt	120	600	5
TOLUENE	<600	ug/Kgdrywt	120	600	5
1,2-DIBROMOETHANE	<600	ug/Kgdrywt	120	600	5
ETHYLBENZENE	<600	ug/Kgdrywt	120	600	5
NAPHTHALENE	<600	ug/Kgdrywt	120	600	5
MTBE	<600	ug/Kgdrywt	120	600	5
TOTAL XYLENES	<600	ug/Kgdrywt	120	600	5
DIBROMOFLUOROMETHANE	92	%	120		
1,2-DICHLOROETHANE-D4	86	%	120		
TOLUENE-D8	102	%	120		
P-BROMOFLUOROBENZENE	95	%	120		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: VBLKZ11B
SDG: WP2792
Report Date: 8/2/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 100
Method: SW8260
Date Analyzed: 6/11/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKZ11B	SL	-	-	6/11/99	DJP	5030	DJP

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/Kg	1.0	5	5
TOLUENE	<5	ug/Kg	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/Kg	1.0	5	5
ETHYLBENZENE	<5	ug/Kg	1.0	5	5
NAPHTHALENE	<5	ug/Kg	1.0	5	5
MTBE	<5	ug/Kg	1.0	5	5
TOTAL XYLENES	<5	ug/Kg	1.0	5	5
DIBROMOFLUOROMETHANE	130	%	1.0		
1,2-DICHLOROETHANE-D4	126	%	1.0		
TOLUENE-D8	119	%	1.0		
P-BROMOFLUOROBENZENE	88	%	1.0		

Report Notes:

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: Z1075 **Sample ID:** LCSZ11A **Date Run:** 6/11/99

Analyst: DJP **Time Injected** 2:41:00 PM **Matrix:** SL

Compound Name	Spike Amt (ug/Kg)	Result (ug/Kg)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	50.0	100	60-140
BENZENE	50	51.8	104	60-140
ETHYLBENZENE	50	66.1	132	60-140
MTBE	50	50.7	101	60-140
NAPHTHALENE	50	62.2	124	60-140
TOLUENE	50	50.9	102	60-140
TOTAL XYLENES	150	202	135	60-140

*** Out of Limits**

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan
Tetra Tech NUS
1401 Oven Park Dr.
Suite 102
Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number: VBLKZ16B
SDG: WP2792
Report Date: 8/2/99
PO No. : N7912-P99264
Project: CTO #68
% Solids: 100
Method: SW8260
Date Analyzed: 6/16/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKZ16B	SL	-	-	6/16/99	KRT	5030	KRT

Compound	Result	Units	DF	Sample PQL	Method PQL
BENZENE	<5	ug/Kg	1.0	5	5
TOLUENE	<5	ug/Kg	1.0	5	5
1,2-DIBROMOETHANE	<5	ug/Kg	1.0	5	5
ETHYLBENZENE	<5	ug/Kg	1.0	5	5
NAPHTHALENE	<5	ug/Kg	1.0	5	5
MTBE	<5	ug/Kg	1.0	5	5
TOTAL XYLENES	<5	ug/Kg	1.0	5	5
DIBROMOFLUOROMETHANE	125	%	1.0		
1,2-DICHLOROETHANE-D4	127	%	1.0		
TOLUENE-D8	120	%	1.0		
P-BROMOFLUOROBENZENE	105	%	1.0		

Report Notes:

Katahdin Analytical Services
8260 LCS Recovery Sheet

Lab File: Z1119 **Sample ID: LCSZ16A** **Date Run: 6/16/99**

Analyst: KRT **Time Injected 2:17:00 PM** **Matrix: SL**

Compound Name	Spike Amt (ug/Kg)	Result (ug/Kg)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	51.8	104	60-140
BENZENE	50	53.8	108	60-140
ETHYLBENZENE	50	64.3	129	60-140
MTBE	50	53.9	108	60-140
NAPHTHALENE	50	63.2	126	60-140
TOLUENE	50	52.5	105	60-140
TOTAL XYLENES	150	201	134	60-140

*** Out of Limits**

5A
SPIKE SAMPLE RECOVERY

Lab Name: Katahdin Analytical Services

Client Field ID: 25SLB090304S

Matrix: SOIL

SDG Name: WP2792

Percent Solids: 80.8

Lab Sample ID: WP2792-001S

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

Analyte	Spiked Sample Result	C	Sample Result	C	Spike Added	%R	Q	Control Limits (%R) Low	Control Limits (%R) High	M
LEAD	64.6423		10.4929		53.82	100.6		75	125	P

Comments:

5A

SPIKE SAMPLE RECOVERY

Lab Name: Katahdin Analytical Services

Matrix: SOIL

Percent Solids: 80.8

Client Field ID: 25SLB090304S

SDG Name: WP2792

Lab Sample ID: WP2792-001P

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

Analyte	Spiked Sample Result	C	Sample Result	C	Spike Added	%R	Q	Control Limits (%R) Low	High	M
LEAD	61.0438		10.4929		50.32	100.5		75	125	P

Comments:

5D

SPIKE DUPLICATES

Lab Name: Katahdin Analytical Services

Client Field ID: 25SLB090304

Matrix: SOIL

SDG Name: WP2792

Percent Solids: 80.8

Lab Sample ID: WP2792-001

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

Analyte	Control Limits	Spike Result	C	Spike Dup. Result	C	RPD	Q	M
LEAD		64.6423		61.0438		5.7		P

Comments:

LABORATORY CONTROL SAMPLES

Lab Name: Katahdin Analytical Services **Sample ID:** LCSSPG07ICS0

Matrix: SOIL **SDG Name:** WP2792

QC Batch ID: PG07ICS0

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

Analyte	TRUE	FOUND	% R	LIMITS (%)	
LEAD	66.0	71.20	107.9	68	132

Katahdin Analytical Services, Inc.
Quality Control Report

Method Blank and Laboratory Control Sample Results

Client:	Tetra Tech NUS
Work Order:	WP2792

			METHOD BLANK RESULTS				LABORATORY CONTROL SAMPLE RESULTS					
Parameter	Date of Prep	Date of Analysis	Units	Concentration Measured in Blank	Acceptance Range	Practical Quantitation Level**	Units	True Value	Measured Value	Percent Recovered	Acceptance Range (%)	Acceptance Range (mg/kg)
TS -Total Residue	11-Jun-99	14-Jun-99	wt %	< 0.10	< 0.10	0.10	wt %	90	89.6	99.6	80-120	
	11-Jun-99	14-Jun-99	wt %	< 0.10	< 0.10	0.10						
TCO-Total Combustible Organics	11-Jun-99	14-Jun-99	wt %	< 0.10	< 0.10	0.10						

** Practical quantitation level is the lowest concentration measurable for samples with normal chemical and physical composition during routine laboratory operations.

DATA QUALITY COMMENTS:
Results of all quality control measurements are within the laboratory and method specified acceptance range except as noted.

5000003

Katahdin Analytical Services, Inc.
Quality Control Report

Duplicate and Matrix Spike/Matrix Spike Duplicate Results

Client:	Tetra Tech NUS
Work Order:	WP2792

DUPLICATE RESULTS / *MATRIX SPIKE/MATRIX SPIKE DUPLICATE RESULTS*

Parameter	Sample No	Units	Sample Measurements Rep 1	Sample Measurements Rep 2	Mean Conc	RPD (%)	Acceptance Range for RPD (%)	Units	Concentration or Quantity: Sampl Only	Spike Added	Sample +Spike Dup 1	Sample +Spike Dup 2	Matrix Spike Recovery (%): Sample +Spike Dup 1	Sample +Spike Dup 2	Acceptance Range (%)	RPD (%)	Acceptance Range (%)
TS	WP2792-8	mg/L	83.9	83.8	83.9	0.1	0-20	mg/L		NA					75-125		0-20
	WP2792-12	mg/L	91.3	91.7	91.5	0.4	0-20	mg/L		NA					75-125		0-20
TCO	WP2792-12	mg/L	1.40	1.37	1.39	2.2	0-20	mg/L		NA					75-125		0-20

RPD = Relative percent difference, which is the absolute value of the difference between two replicate results divided by the mean concentration then multiplied by 100%.

NA = Not applicable.

DATA QUALITY COMMENTS:
Results of all quality control measurements are within the laboratory or contract specified acceptance range except as noted. The laboratory does not use the sample duplicate and matrix spike acceptance ranges as acceptance criteria for a specific analysis. Sample duplicate and matrix spike data are used to evaluate method performance in the environmental sample matrix only. Please refer to LCS data for assessment of quality control for each parameter.

5000004

CASE NARRATIVE
for
Katahdin Analytical
Westbrook, ME
Former Charleston Naval Complex Site
SDG #96242

June 29, 1999

Laboratory Identification:

General Engineering Laboratories, Inc. (GEL)

Mailing Address:

P.O. Box 30712
Charleston, SC 29417

Express Mail Delivery and Shipping Address:

2040 Savage Rd
Charleston, SC 29414

Telephone Number:

(843) 556-8171

Summary:

Sample receipt

The samples from the former Charleston Naval Complex site arrived at General Engineering Laboratories, Inc., Charleston, SC on June 7, 1999, for environmental analyses. All sample containers arrived without any visible signs of tampering or breakage. The samples were delivered with chain of custody documentation and signatures.

The following samples were received by the laboratory:

Laboratory Identification	Sample Description
9906242-01	25SLB130203
9906242-02	25SLB130203D
9906242-03	25SLB50304
9906242-04	25SLB150304D

Case Narrative

Sample analyses were conducted using methodology as outlined in General Engineering Laboratories Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are listed below by analytical parameter.

Internal Chain of Custody:

Custody was maintained for all samples.

Data Package:

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, and General Chemistry.

The following are definitions of reporting limits used at General Engineering Laboratories:

DL — Detection Limit: The minimum level of an analyte that can be determined (identified not quantified) with 99% confidence. The values are normally achieved by preparing and analyzing seven aliquots of laboratory water spiked 1 to 5 times the estimated MDL, taking the standard deviation and multiplying it against the one-tailed t-statistic at 99%. This computed value is then verified for reasonableness by repeating the study using the concentration found in the initial study, calculating an F-ratio, and computing the final limit. Sample specific preparation and dilution factors are applied to these limits when they are reported.

The detection limit is the minimum concentration of a substance that can be identified, measured, and reported with 99% confidence that the analyte concentration is above zero. It answers the question "Is It Present."

QL — Quantitation Limit: The lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. The QL is generally 5 to 10 times the MDL. However, it may be nominally chosen within these guidelines to simplify data reporting. For many analytes the QL analyte concentration is selected as the lowest non-zero standard in the calibration curve.

Sample QL's are highly matrix-dependent. Sample specific preparation and dilution factors are applied to these limits when they are reported.

The QL is always $\geq$ DL.

This data package, to the best of my knowledge, is in compliance with technical and administrative requirements.

Valerie Davis

Valerie S. Davis
Project Manager

fc:saic9906242%

Case Narrative for
KATA
SDG# 96242

TOTAL ORGANIC CARBON

Analytical Batch Number: 151981

Analytical Method: SW846 9060 Modified

Laboratory Number	Sample Description
9906242-03	25SLB50304
9906242-04	25SLB150304D
QC622750	Blank
QC622751	Duplicate of 9906242-03
QC622752	Post Spike of 9906242-03
QC622753	Laboratory Control Sample

Sample Preparation:

All samples were prepared in accordance with accepted procedures. The method quoted is only for liquid samples. It is modified to handle soils analysis.

Instrument Calibration:

The instrument used was a Dohrmann DC-190 high temperature combustion TOC analyzer with a Dohrmann solids boat sampler. The instrument was properly calibrated on the day of the analysis.

Sample Preparation:

All samples were prepared in accordance with accepted procedures.

Instrument Calibration:

The instrument used was a Dohrmann DC-80 TOC analyzer. The instrument was properly calibrated.

Holding Time:

All samples were analyzed within the required holding time.

Blanks:

No target analytes were detected in the method blank above the required acceptance limit.

Spike Analyses:

The post spike was run on the following Sample Number.

9906242-03

All analyte recoveries in the post spike were within the required acceptance limits.

Laboratory Control Samples:

All analyte recoveries in the laboratory control sample were within the required acceptance limits.

Sample Duplicates:

All sample duplicate results were within the required acceptance limits.

Dilutions:

None of the samples were diluted.

Non Conformance Reports:

There were no Nonconformance Reports associated with this batch.

Additional Comments:

TOC solid samples are are tested to determine if inorganic carbon such as carbonates and bicarbonates are present in the sample. If so, the sample is acidified to remove the inorganic carbon, then dried in a low temperature oven. Because the sample portion is dried before analysis, the percent moisture correction is not applied to the TOC solid result.

TOTAL PETROLEUM HYDROCARBONS

Analytical Batch Number: 151686

Analytical Method: SW846 9071A

Laboratory Number	Sample Description
9906242-01	25SLB130203
9906242-02	25SLB130203D
QC621595	Blank
QC621596	Laboratory Control Sample
QC621599	Duplicate of 9906242-01
QC621600	Matrix Spike of 9906242-01

Instrument Calibration:

The balance was properly calibrated.

Holding Time:

All samples were analyzed within the required holding time.

Blanks:

No target analytes were detected in the method blank above the required acceptance limit.

Spike Analyses:

The matrix spike was run on the following Sample Number.

9906242-01

All analyte recoveries in the matrix spike were within the required acceptance limits.

Laboratory Control Samples:

All analyte recoveries in the laboratory control sample were within the required acceptance limits.

Sample Duplicates:

All sample duplicate results were within the required acceptance limits.

Dilutions:

None of the samples were diluted.

Non Conformance Reports:

There were no Nonconformance Reports associated with this batch.

The preceding narratives have been reviewed by: [signature] Date: 06/28/19

Page 1 of 1

CHAIN OF CUSTODY RECORD

9906242%

General Engineering Laboratories, Inc.
2040 Savage Road
Charleston, South Carolina 29407
P.O. Box 30712
Charleston, South Carolina 29417
(803) 556-8171

Client Name/Facility Name: Katahdin Analytical

Collected by/Company: Tetra tech NUS

SAMPLE ANALYSIS REQUIRED (x) - use remarks area to specify specific compounds or methods

Use F or P in the boxes to indicate whether sample was filtered and/or preserved

SAMPLE ID	DATE	TIME	WELL	SOIL	COMP	GRAB	# OF CONTAINERS	pH, conductivity	TOC/DOC	TOX	Chloride, Fluoride, Sulfide	Nitrite/Nitrate	VOC - Specify Method required	METALS - specify	Pesticide	Herbicide	Total Phenol	Acid Extractables	B/N Extractables	PCB's	Cyanide	Coliform - specify type		TPH	Remarks
Z5SLB13Ø2Ø3	6/7/99	1040		X		X	1																	X	FID Readings = >5000 ppm
Z5SLB13Ø2Ø3D	6/7/99	1040		X		√	1																	X	" " = ~~75~~
Z5SLB15Ø3Ø4	6/7/99	1115		X		X	1		X																" " = 150 ppm
Z5SLB15Ø3Ø4D	6/7/99	1115		X		X	1		X																

40
.1
.1
.2
.2

Relinquished by:	Date:	Time:	Received by:	Relinquished by:	Date:	Time:	Received by:
[signature]	6/7/99	1814	[signature]				

Relinquished by:	Date:	Time:	Received by lab by:	Date:	Time:	Remarks:
			GEL	6/7/99	18:15	

White = sample collector Yellow = file Pink = with report

INDUSTRIAL SAMPLE RECEIPT REVIEW

GENERAL ENGINEERING LABORATORIES, INC.

Client TetraTech Received by GCC Date 6-5-99

GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

GEL COOLER___ GEL POLY COOLER___ CLIENT COOLER___ OTHER ✓

SAMPLE REVIEW CRITERIA	YES	NO	COMMENTS/QUALIFIERS
1. Were shipping containers received intact and sealed? Call project Manager if No	✓		
2. Is the shipment identified as RADIOACTIVE and/or from a DOE site or subcontainer (see list in EPI SOP S-007)?	—	—	
If YES, was the shipment screened following the radiochemistry survey procedure (EPI SOP S-007)?	—	—	
Were the survey results negative? Call Project Manager if No	—		
3. Were chain of custody documents included?	✓		
4. Were chain of custody documents completed properly? (Ink, signed, match containers)	✓		
5. Did all samples container arrive intact? (sealed, unbroken)? Call Project Manager if No	✓		
6. Were all sample containers properly labeled?	✓		
7. Were proper sample containers received?	✓		
8. Preserved samples checked for proper pH?	✓		
9. Were samples preserved properly? If no, list samples & tests	✓		
10. Shipping container temperature checked?	✓		
11. Was shipping container temperature within specifications (4+2C) If no, Call Project Manager	✓		4°C
12. Were samples received within holding time? if No, Call Project Manager	✓		
13. Were VOA vials free of headspace?	—	—	

REVIEW [signature] DATE 6-5-99 SA - SEALS ATTACHED NSA NO SEALS ATTACHED

Client:	Katahdin Analytical 340 County Road Westbrook, Maine 04092
Contact:	Ms. Andrea Colby
Project Description:	Former Naval Complex

cc: KATA00199 Report Date: June 24, 1999

Sample ID	: 25SLB130203
Lab ID	: 9906242-01
Matrix	: Soil
Date Collected	: 06/07/99
Date Received	: 06/07/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons		1560	59.0	118	mg/kg	1.0	AAT	06/22/99	0950	151686	1
Evaporative Loss @ 105 C		15.0	1.00	1.00	wt%	1.0	GJ	06/08/99	1455	150962	2

M = Method	Method-Description
M 1	SW846 9071A
M 2	EPA 3550

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By

Client:	Katahdin Analytical 340 County Road Westbrook, Maine 04092
Contact:	Ms. Andrea Colby
Project Description:	Former Naval Complex

cc: KATA00199 Report Date: June 24, 1999

Sample ID	: 25SLB130203D
Lab ID	: 9906242-02
Matrix	: Soil
Date Collected	: 06/07/99
Date Received	: 06/07/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons		426	56.0	112	mg/kg	1.0	AAT	06/22/99	0950	151686	1
Evaporative Loss @ 105 C		11.0	1.00	1.00	wt%	1.0	GJ	06/08/99	1455	150962	2

M = Method	Method-Description
M 1	SW846 9071A
M 2	EPA 3550

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed
in accordance with General Engineering Laboratories
standard operating procedures. Please direct
any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By

Client:	Katahdin Analytical 340 County Road Westbrook, Maine 04092
Contact:	Ms. Andrea Colby
Project Description:	Former Naval Complex

25SLB1503041

cc: KATA00199 Report Date: June 24, 1999 Page 1 of 1

Sample ID	: 25SLB50304
Lab ID	: 9906242-03
Matrix	: Soil
Date Collected	: 06/07/99
Date Received	: 06/07/99
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Evaporative Loss @ 105 C		10.0	1.00	1.00	wt%	1.0	GJ	06/08/99	1455	150962	1
Total Organic Carbon		771	43.1	100	mg/kg	1.0	LIB	06/23/99	1452	151981	

M = Method	Method-Description
M 1	EPA 3550
M 2	SW846 9060 Modified

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed
in accordance with General Engineering Laboratories
standard operating procedures. Please direct
any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By

Client:	Katahdin Analytical 340 County Road Westbrook, Maine 04092
Contact:	Ms. Andrea Colby
Project Description:	Former Naval Complex

771
460
1,231

cc: KATA00199

Report Date: June 24, 1999

Sample ID	: 25SLB150304D
Lab ID	: 9906242-04
Matrix	: Soil
Date Collected	: 06/07/99
Date Received	: 06/07/99
Priority	: Routine
Collector	: Client

AVG. 615.5

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Evaporative Loss @ 105 C		10.0	1.00	1.00	wt%	1.0	GJ	06/08/99	1455	150962	1
Total Organic Carbon		460	43.1	100	mg/kg	1.0	LS	06/23/99	1558	151981	2

M = Method	Method-Description
M 1	EPA 3550
M 2	SW846 9060 Modified

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

Data reported in mass/mass units is reported as 'dry weight'.

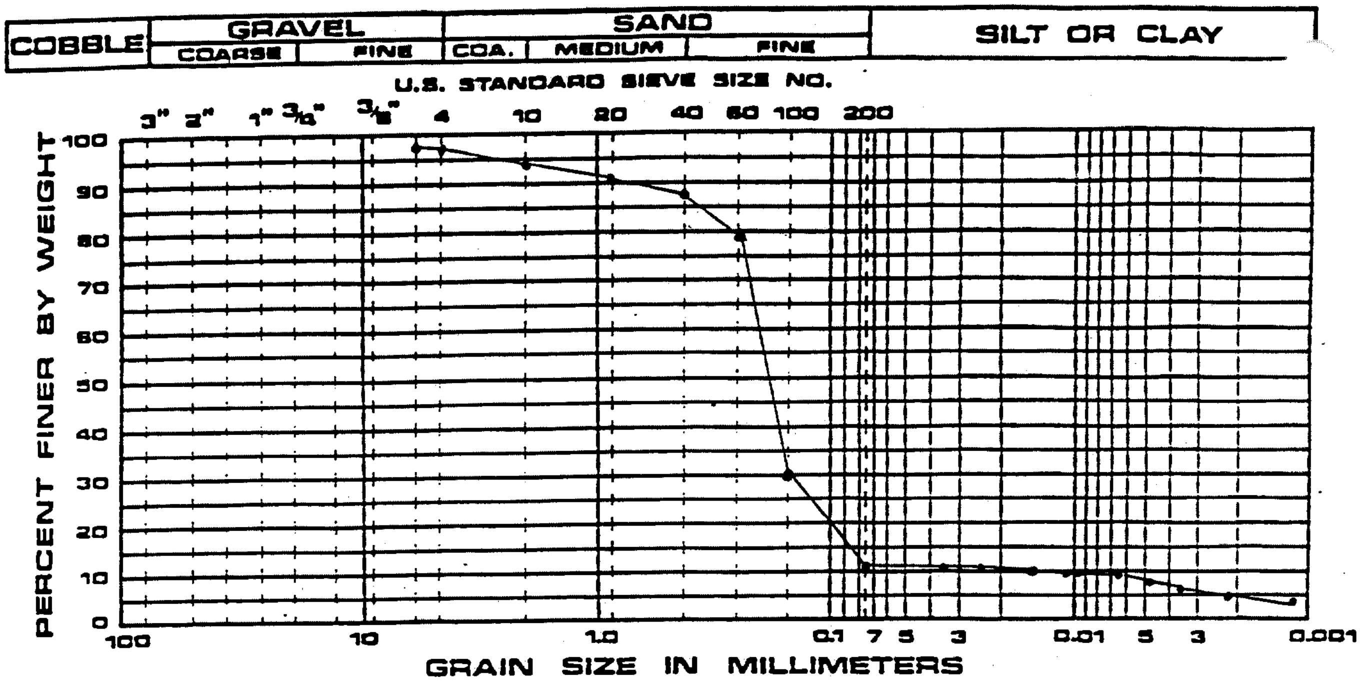
This data report has been prepared and reviewed
in accordance with General Engineering Laboratories
standard operating procedures. Please direct
any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By

JOB NO: 91-008

SLB12
0203

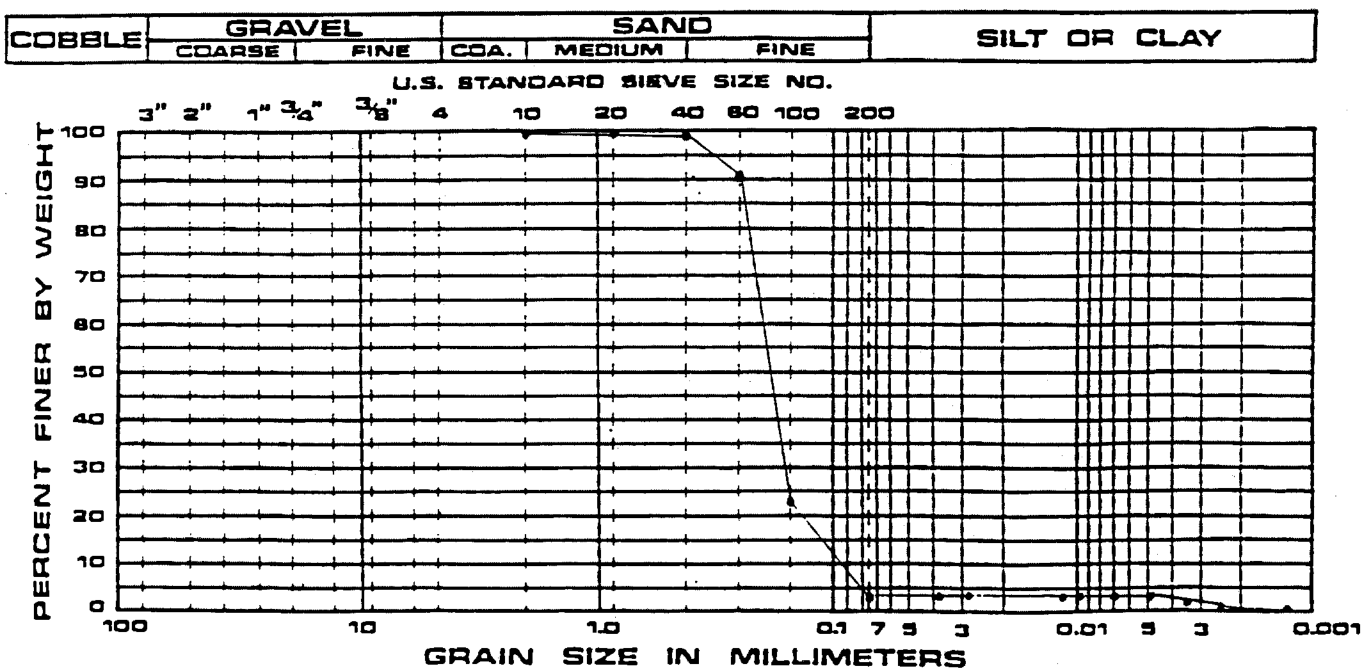
GRAIN SIZE ANALYSIS



PLOT	SOURCE	SAMP.	DEPTH	CLASSIFICATION		W
●	WP27829	23				

SLB12
0708

GRAIN SIZE ANALYSIS



PLOT	SOURCE	SAMP.	DEPTH	CLASSIFICATION		W
●	WP279.210	24				

S. W. COLE ENGINEERING, INC.

REPORT OF GRADATION
ASTM C-117, C-136

Project No. 99008
Date 06/09/1999

Project MISCELLANEOUS

Client KATAHDIN ANALYTICAL

Sample No. 23, SILTY SAND, WP2792-9 25SLB120203

Sieve Size	Percent Passing	PROJECT Specifications %
1/2 "	100.0	
1/4 "	98.0	
# 4	97.0	
# 10	94.2	
# 20	91.4	
# 40	88.5	
# 60	79.6	
# 100	30.2	
# 200	11.8	

S. W. COLE ENGINEERING, INC.

R E P O R T O F G R A D A T I O N
ASTM C-117, C-136

Project No. 99008
Date 06/09/1999

Project MISCELLANEOUS

Client KATAHDIN ANALYTICAL

Sample No. 24, SILTY SAND, WP2792-10 25SLB120708

Sieve Size	Percent Passing	PROJECT Specifications %
# 4	100.0	
# 10	99.9	
# 20	99.7	
# 40	99.0	
# 60	91.0	
# 100	23.6	
# 200	3.4	

APPENDIX C

AQUIFER CHARACTERIZATION DATA

SUMMARY OF SLUG TEST
SOUTH CAROLINA
Department of Health and Environmental Control (DHEC)

Site Data

SITE ID #: 01782 **COUNTY:** North Charleston, South Carolina

FACILITY NAME: Former Charleston Naval Complex

Slug Data

See *Zone F RCRA Facility Investigation Report, E/A&H, 1996* for all data measurements.

Water Level Recovery Data was measured by a Hermit Data Logger.

Slug Test Conducted in well(s) number	**613004**	**613004**	**620002**	**620002**
Initial Rise/Drawdown in well (feet)	Rise=4.1	Fall=1.5	Rise=3.8	Fall=2.0
Radius of Well Casing (feet)	0.083	0.083	0.083	0.083
Effective Radius of Well (feet)	--	--	--	--
Static Saturated Aquifer Thickness (feet)	6	6	6.5	6.5
Length of Well Screen (feet)	9.4	9.4	9.4	9.4
Static Height of Water Column in Well (ft)	6	6	6.5	6.5

Calculations

The method for aquifer calculations was: Bouwer-Rice

Calculated values by well were as follows:

Slug Test Conducted in well(s) number	**613004**	**62002**
Hydraulic Conductivity (ft/day) (geometric mean)	0.32	0.41

Thickness of the aquifer used to calculate hydraulic conductivity was 5 to 6 feet.
The aquifer is water table.
The estimated seepage velocity is 6.8 feet per year based on
a hydraulic conductivity of 0.7 ft/day (for Quaternary sand aquifer), a hydraulic gradient of 0.0096 (from 9/11/99 Site 25 potentiometric data), and
a porosity of 36 per cent for the Quaternary sandy soil.

SUMMARY OF SLUG TEST
SOUTH CAROLINA
Department of Health and Environmental Control (DHEC)

Site Data

SITE ID #: 01782 **COUNTY:** North Charleston, South Carolina

FACILITY NAME: Former Charleston Naval Complex

Slug Data

See *Zone F RCRA Facility Investigation Report* for all data measurements.

Water Level Recovery Data was measured by a Hermit Data Logger.

Slug Test Conducted in well(s) number	**607001**	**607001**	**613001**	**613001**
Initial Rise/Drawdown in well (feet)	Rise=1.4	Fall=1.5	Rise=3.2	Fall=1.5
Radius of Well Casing (feet)	0.083	0.083	0.083	0.083
Effective Radius of Well (feet)	--	--	--	--
Static Saturated Aquifer Thickness (feet)	5	5	4	4
Length of Well Screen (feet)	1.9	1.9	9.4	9.4
Static Height of Water Column in Well (ft)	5	5	4	4

Calculations

The method for aquifer calculations was: Bouwer-Rice

Calculated values by well were as follows:

Slug Test Conducted in well(s) number	**607001**	**613001**	**Geo. Mean of 4 Wells**
Hydraulic Conductivity (ft/day) (geometric mean)	1.8	1.0	**0.7**

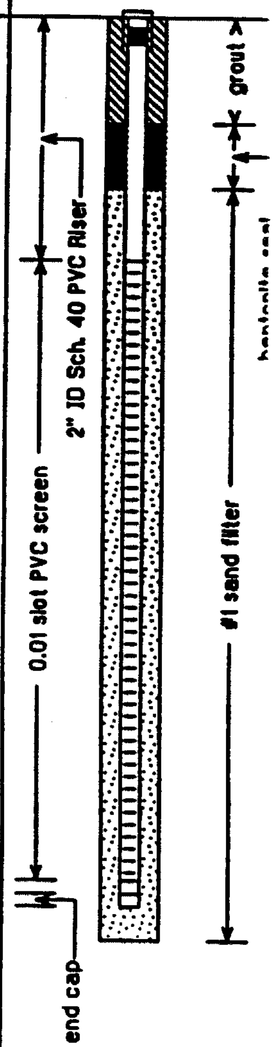
EnSafe/Allen & Hoshall

Monitoring Well NBCF613004

Project: *ZONE F - Naval Base Charleston*	Coordinates: *2319622.98 E, 373823.70 N*
Location: *Charleston, SC*	Surface Elevation: *9.8 feet msl*
Started at *10:30 on 10-22-96*	TOC Elevation: *9.44 feet msl*
Completed at *13:30 on 10-22-96*	Depth to Groundwater: *7.01 feet TOC* Measured: *12/18/96*
Drilling Method: *4.25" ID (7.5" OD) HSA with split spoon sampler*	Groundwater Elevation: *2.43 feet msl*
Drilling Company: *Alliance Environmental (SC cert. # 889)*	Total Well Depth: *13.5 feet bgs*
Geologist: *B. Blythe*	Well Screen: *3.7 to 13.1 feet bgs*

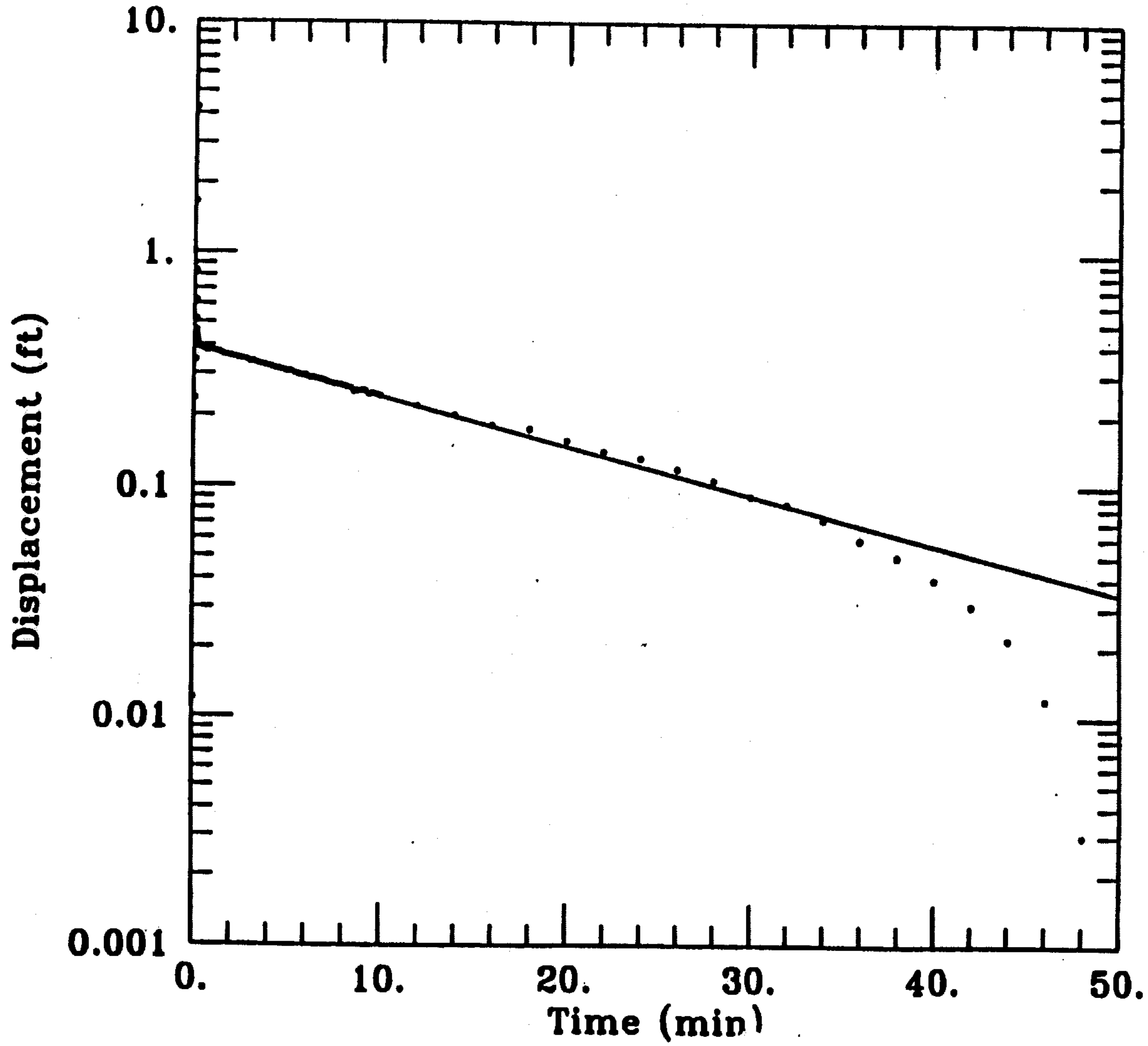
DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Surface conditions: Asphalt	
							SP / SC	Poor recovery: most is mottled CaCO3 sand with ROC and trace amounts of black to green mottled clay; moist; soft; some sandy shell hash seem on bottom of spoon; pepper color.	6.8 / 6.3
5			1	20	2.4				
								Shelby tube: Top: CaCO3 gravel on top; tan; dry; Bottom: tan and brown red mottled; moist to wet; clayey sand to sandy clay; soft; medium plasticity.	
			2	100	0				
							SP / SC	Clayey sand: same as bottom of shelby tube above.	1.8 / .8
10			3	40	0				
							SC / SP	Clay: gray to mottled red and brown; fat; stiff; medium plasticity; alternates to wet sands at bottom of spoon.	1.4 / 3
			4	75	0				
15									
20									

WELL DIAGRAM



Client: CLEAN	Company: E/A&H
Location: NAVAL BASE CHARLESTON	Project: 2906-08450

FALLING HEAD SLUG TEST NBCF613004



DATA SET:
61304FAL.AQT
04/15/97

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: January 1997

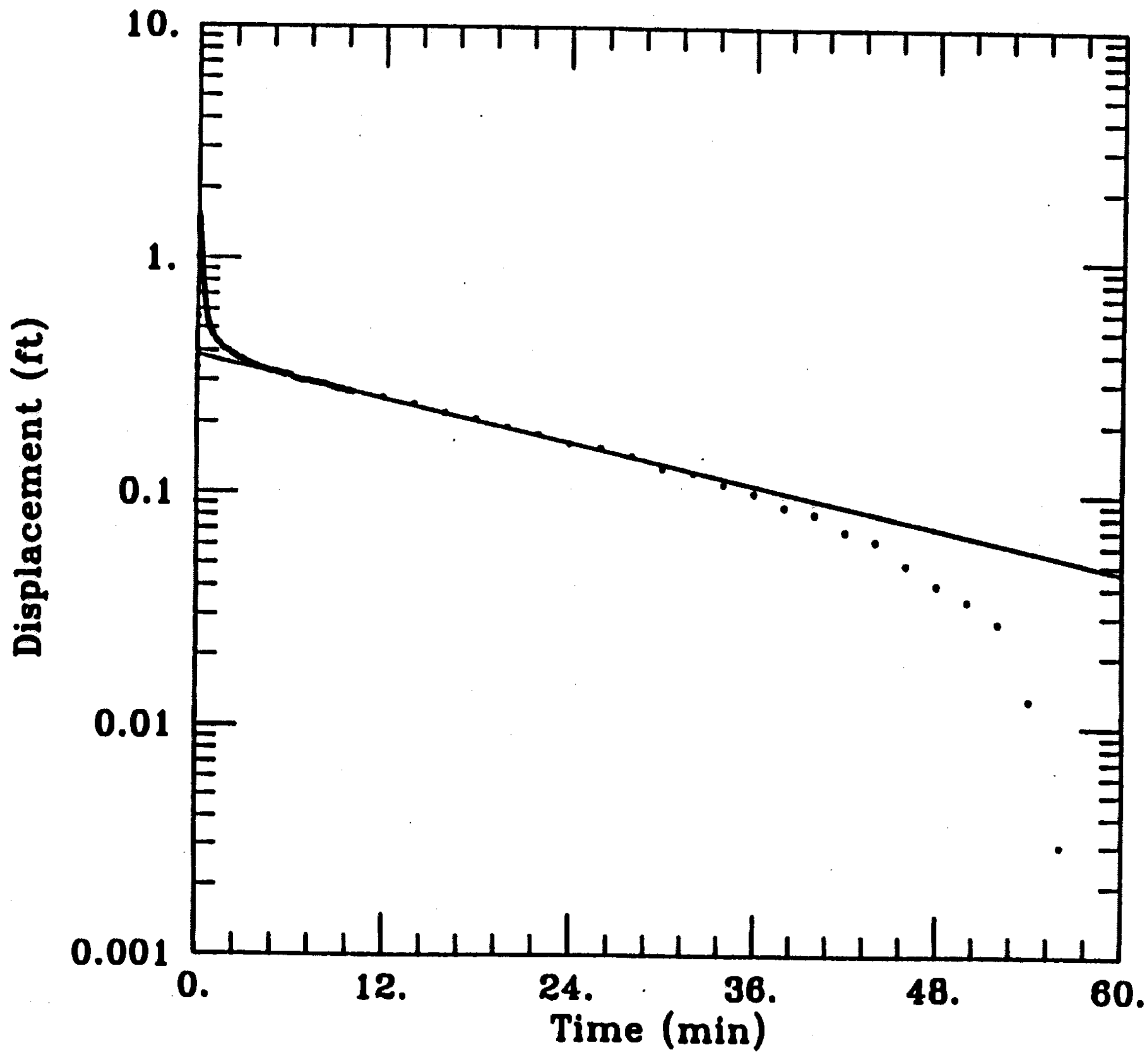
TEST DATA:
H0 = 1. ft
rc = 0.083 ft
rw = 0.3125 ft
L = 6. ft
b = 6. ft
H = 6. ft

PARAMETER ESTIMATES:
K = 0.0002619 ft/min
y0 = 0.391 ft

AQTESOl

Client: CLEAN	Company: E/A&H
Location: NAVAL BASE CHARLESTON	Project: 2906-08450

RISING HEAD SLUG TEST NBCF613004



DATA SET:
61304RIS.AQT
04/15/97

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: January 1997

TEST DATA:
H0 = 1. ft
rc = 0.083 ft
rw = 0.3125 ft
L = 6. ft
b = 6. ft
H = 6. ft

PARAMETER ESTIMATES:
K = 0.0001895 ft/min
y0 = 0.384 ft

AQTESOI

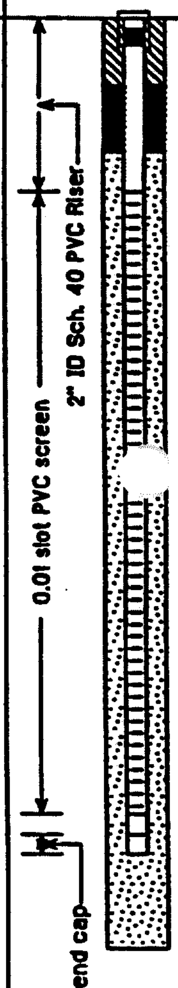
EnSafe/Allen & Hoshall

Monitoring Well NBCF620002

Project: ZONE F - Naval Base Charleston	Coordinates: 2320270.09 E, 373259.77 N
Location: Charleston, SC	Surface Elevation: 9.8 feet msl
Started at 14:30 on 09-03-96	TOC Elevation: 9.58 feet msl
Completed at 16:15 on 09-03-96	Depth to Groundwater: 5.60 feet TOC Measured: 12/18/96
Drilling Method: 4.25" ID (7.5" OD) HSA with split spoon sampler	Groundwater Elevation: 3.98 feet msl
Drilling Company: Alliance Environmental (SC cert. #889)	Total Well Depth: 12.6 feet bgs
Geologist: D. Doyle	Well Screen: 2.6 to 12.0 feet bgs

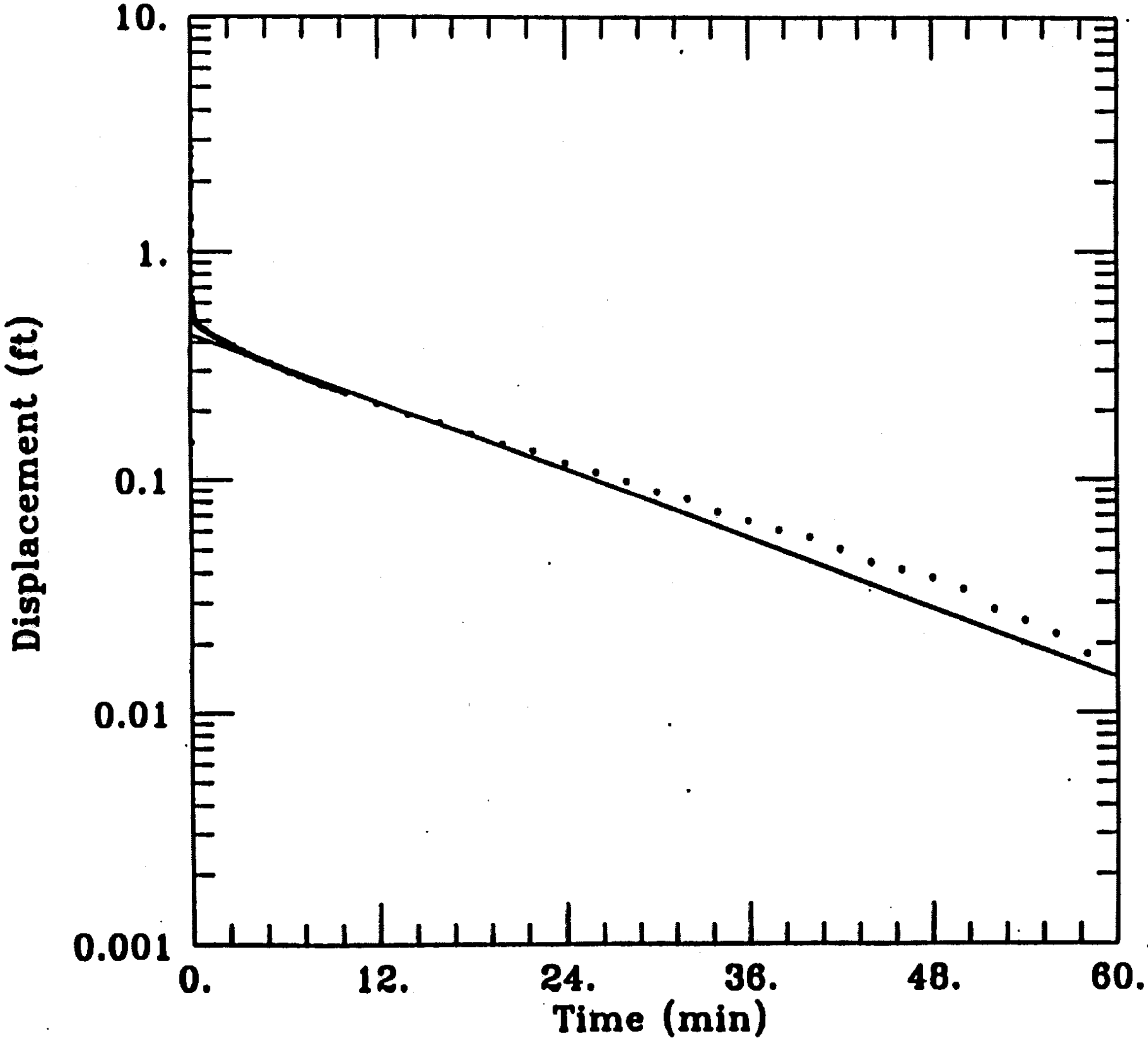
DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Surface conditions: Asphalt.	
5							CL	Clay: gray w/ red-brown; fine to medium sand; stiff; moist.	4.8
			1	100	2		CL/SC	Sand and clay: gray w/ some red-brown; fine to medium; stiff; moist.	3 2.8
			2	100				Shelby Tube (7-9' bgs): bottom: Sand: gray; fine to coarse; dense; saturated.	
10							SW	Sand: gray; fine to coarse; dense; saturated.	-2
			3	100	0				-2.2
15									
20									

WELL DIAGRAM



Client: CLEAN	Company: E/A&H
Location: NAVAL BASE CHARLESTON	Project: 2906-08450

FALLING HEAD SLUG TEST NBCF620002



DATA SET:
62002FAL.AQT
04/16/97

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: January 1997

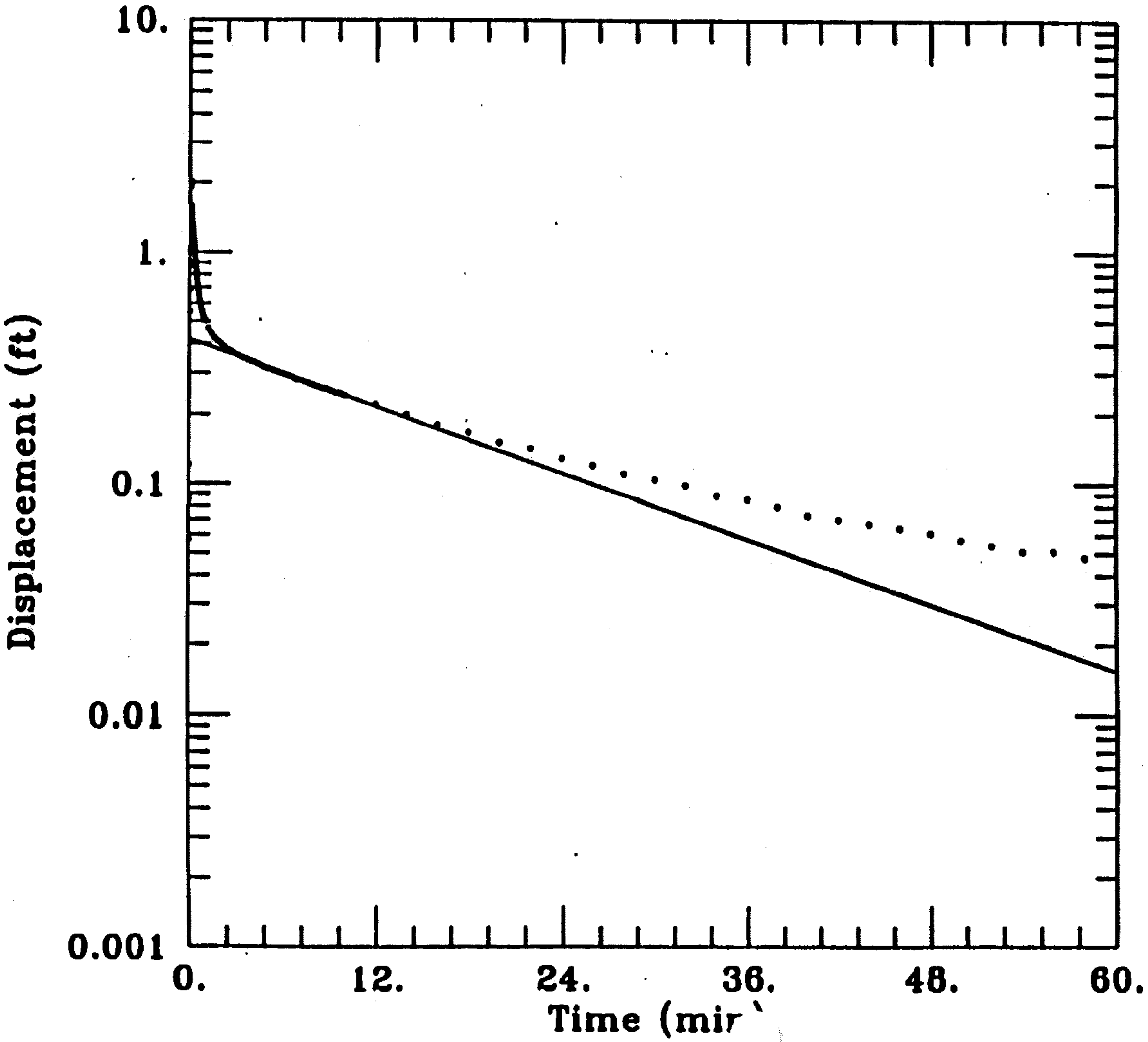
TEST DATA:
H0 = 1. ft
rc = 0.083 ft
rw = 0.3125 ft
L = 6.5 ft
b = 6.5 ft
H = 6.5 ft

PARAMETER ESTIMATES:
K = 0.0002918 ft/min
y0 = 0.4329 ft

AQTESOL

Client: CLEAN	Company: E/A&H
Location: NAVAL BASE CHARLESTON	Project: 2906-08450

RISING HEAD SLUG TEST NBCF620002



DATA SET:
62002RIS.AQT
04/16/97

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: January 1997

TEST DATA:
H0 = 1. ft
rc = 0.083 ft
rw = 0.3125 ft
L = 6.5 ft
b = 6.5 ft
H = 6.5 ft

PARAMETER ESTIMATES:
K = 0.000283 ft/min
y0 = 0.419 ft

AQTESOI

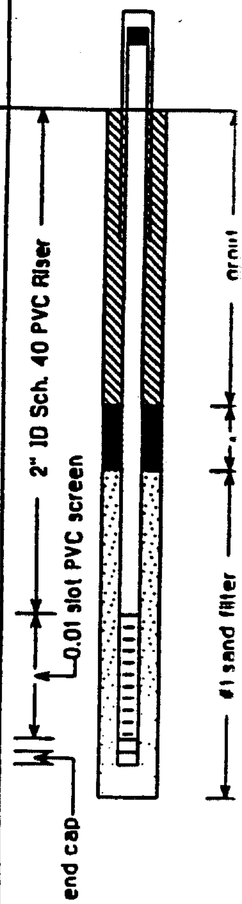
EnSafe/Allen & Hoshall

Monitoring Well NBCF607001

Project: ZONE F - Naval Base Charleston	Coordinates: 2317609.15 E, 374168.33 N
Location: Charleston, SC	Surface Elevation: 8.5 feet msl
Started at 14:05 on 11-02-96	TOC Elevation: 10.78 feet msl
Completed at 14:30 on 11-02-96	Depth to Groundwater: 8.67 feet TOC Measured: 12/18/96
Drilling Method: 4.25" ID (7.5" OD) HSA with split spoon sampler	Groundwater Elevation: 2.11 feet msl
Drilling Company: Alliance Environmental (SC cert. #889)	Total Well Depth: 10.0 feet bgs
Geologist: B. Blythe	Well Screen: 7.7 to 9.6 feet bgs

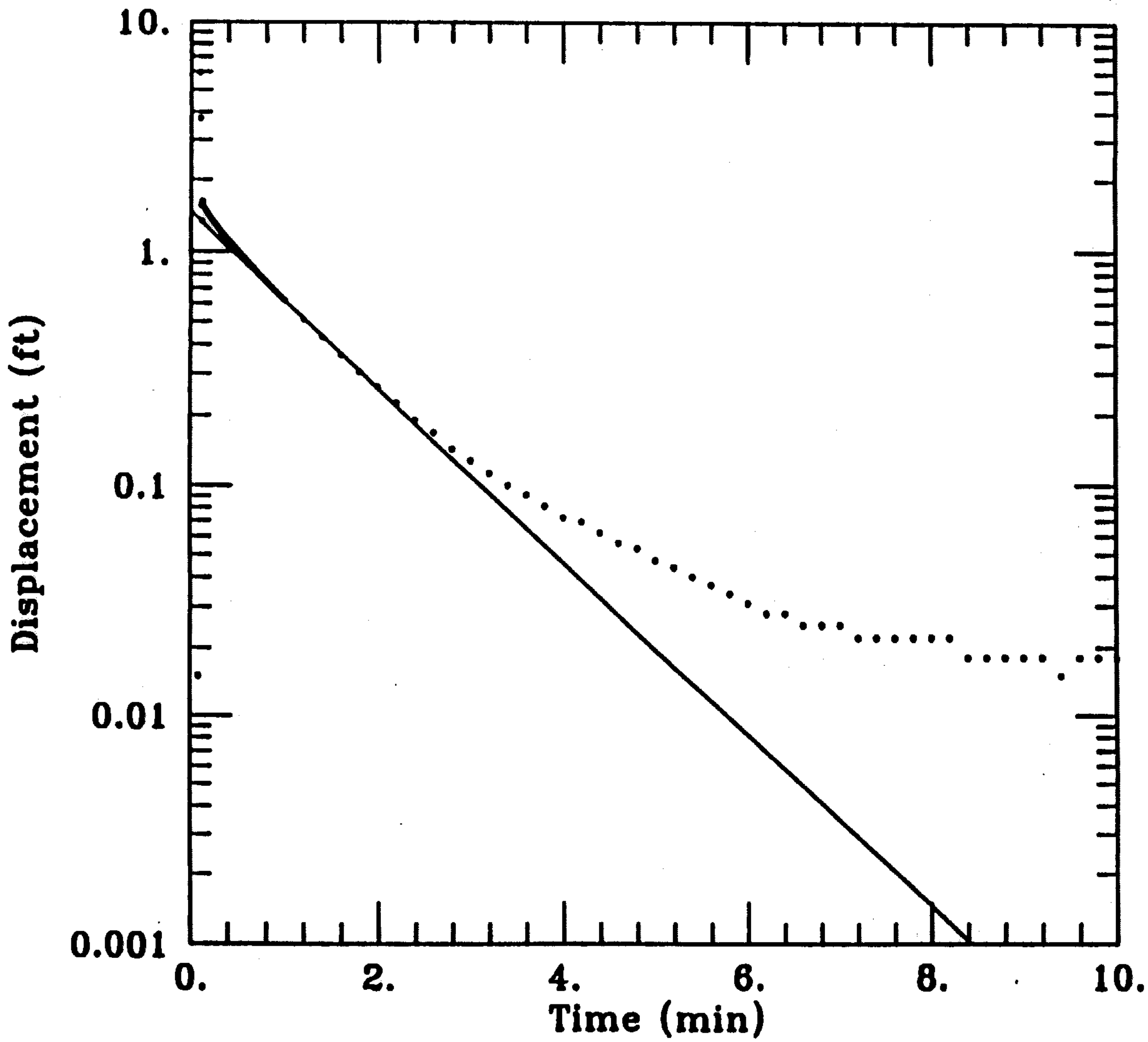
DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Surface: Asphalt.	
								Note: No splitspoon samples were taken at this location due to detailed lithologic sampling in NBCF60701D located approximately 25 ft east-northeast. Please refer to log of NBCF60701D for specific lithologic details.	
5									
10									
15									
20									

WELL DIAGRAM



Client: CLEAN	Company: E/A&H
Location: NAVAL BASE CHARLESTON	Project: 2906-08450

FALLING HEAD SLUG TEST NBCF607001



DATA SET:
60701FAL.AQT
04/11/97

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: January 1997

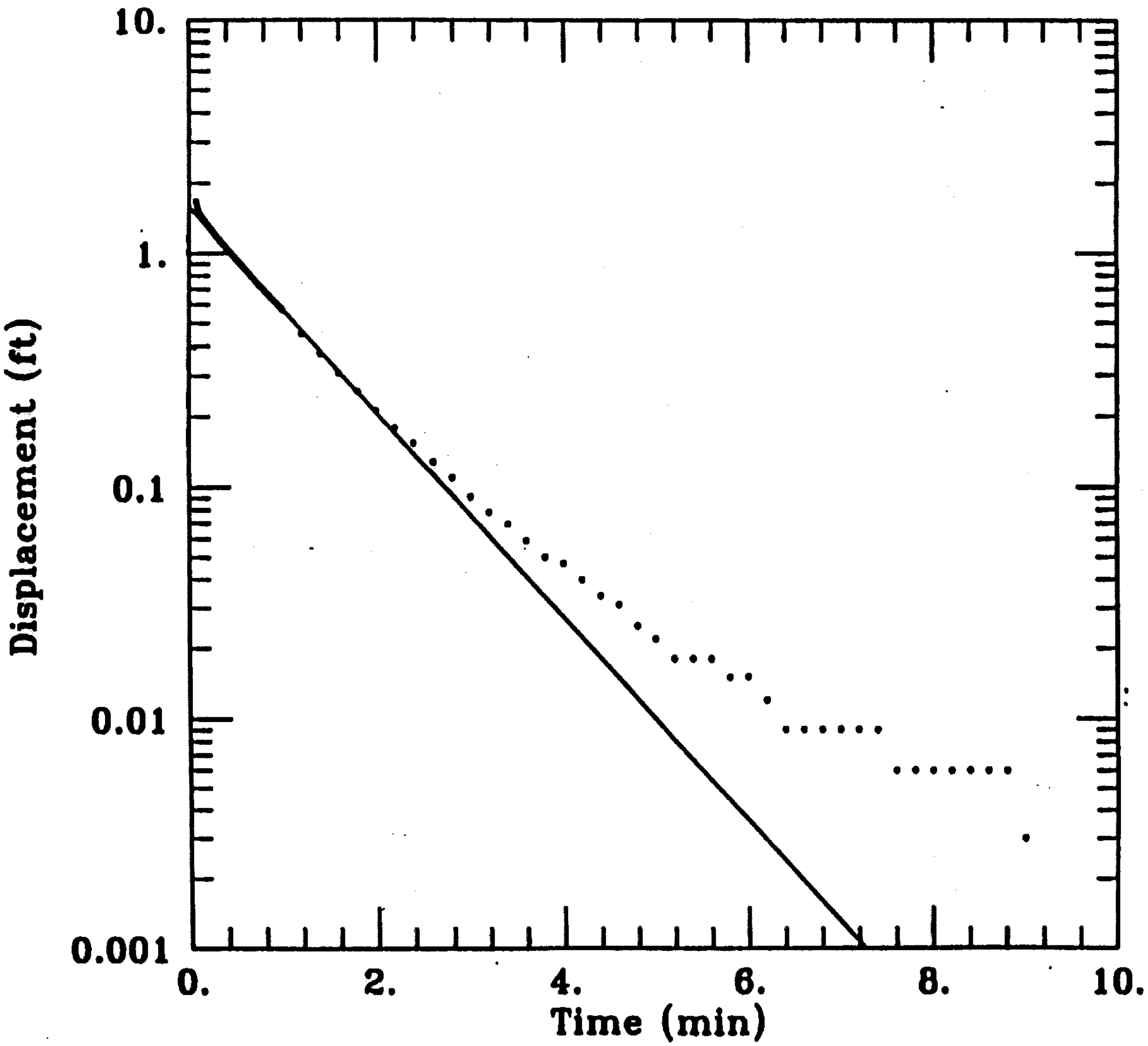
TEST DATA:
H0 = 1. ft
rc = 0.083 ft
rw = 0.3125 ft
L = 5. ft
b = 5. ft
H = 5. ft

PARAMETER ESTIMATES:
K = 0.001209 ft/min
y0 = 1.457 ft

AQTESOL

Client: CLEAN	Company: E/A&H
Location: NAVAL BASE CHARLESTON	Project: 2906-08450

RISING HEAD SLUG TEST NBCF607001



DATA SET:
60701RIS.AQT
04/11/97

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: January 1997

TEST DATA:
H0 = 1. ft
rc = 0.083 ft
rw = 0.3125 ft
L = 5. ft
b = 5. ft
H = 5. ft

PARAMETER ESTIMATES:
K = 0.001418 ft/min
y0 = 1.581 ft

AQTESO

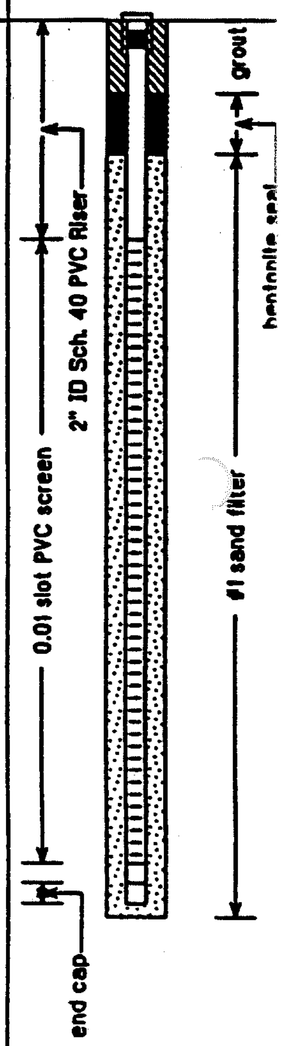
EnSafe/Allen & Hoshall

Monitoring Well NBCF613001

Project: ZONE F - Naval Base Charleston	Coordinates: 2319224.29 E, 374017.05 N
Location: Charleston, SC	Surface Elevation: 9.5 feet msl
Started at 14:00 on 10-21-96	TOC Elevation: 9.48 feet msl
Completed at 15:30 on 10-21-96	Depth to Groundwater: 8.90 feet TOC Measured: 12/18/96
Drilling Method: 4.25" ID (7.5" OD) HSA with split spoon sampler	Groundwater Elevation: 0.58 feet msl
Drilling Company: Alliance Environmental (SC cert. # 889)	Total Well Depth: 13.3 feet bgs
Geologist: B. Blythe	Well Screen: 3.3 to 12.7 feet bgs

DEPTH IN FEET	LITHOLOGIC SAMPLE	ANALYTICAL SAMPLE	SAMPLE NO.	% RECOVERY	PID (ppm)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	ELEV. (ft-msl)
								Surface conditions: Asphalt	
								No recovery: evidence of sandy clay with mottled black organic sandy clay on augers.	
5			1	0				No recovery.	
			2	0			SM	Sand: red and grey; fine to medium; silty; dense; dry to moist.	2.5
							SM CL	Sand and clay: gray to green; fine to medium; dense; moist.	1.8 / 1.5
			3	50	0				
10							SC	Sand: gray to green; clayey; fine to medium; dense; moist; with saturated sand lenses at 11.2 - 11.4.	-.5
			4	95	0				-2.4
15									
20									

WELL DIAGRAM



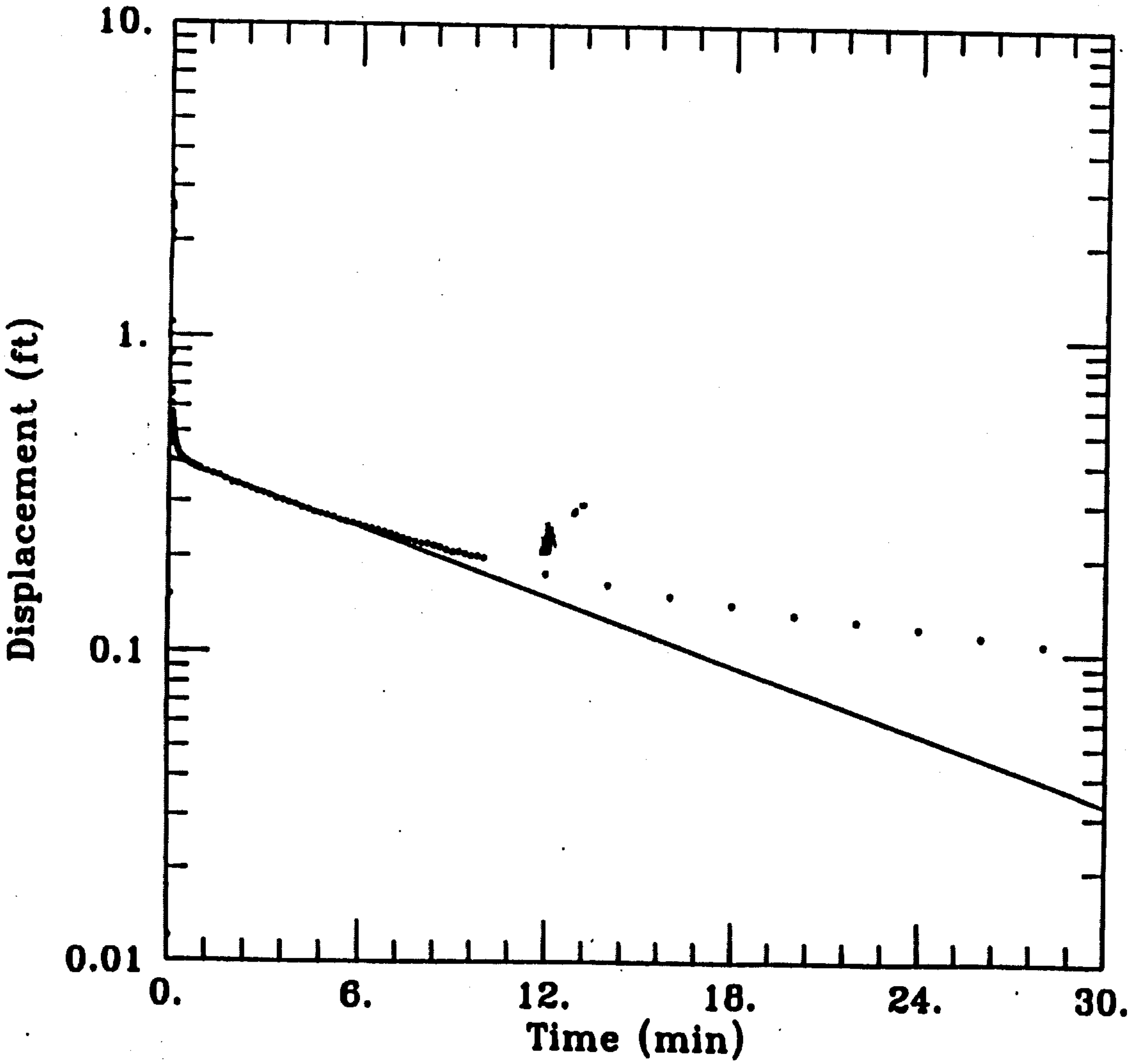
Client: CLEAN

Company: E/A&H

Location: NAVAL BASE CHARLESTON

Project: 2906-08450

FALLING HEAD SLUG TEST NBCF613001



DATA SET:
61301FAL.AQT
04/15/97

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: January 1997

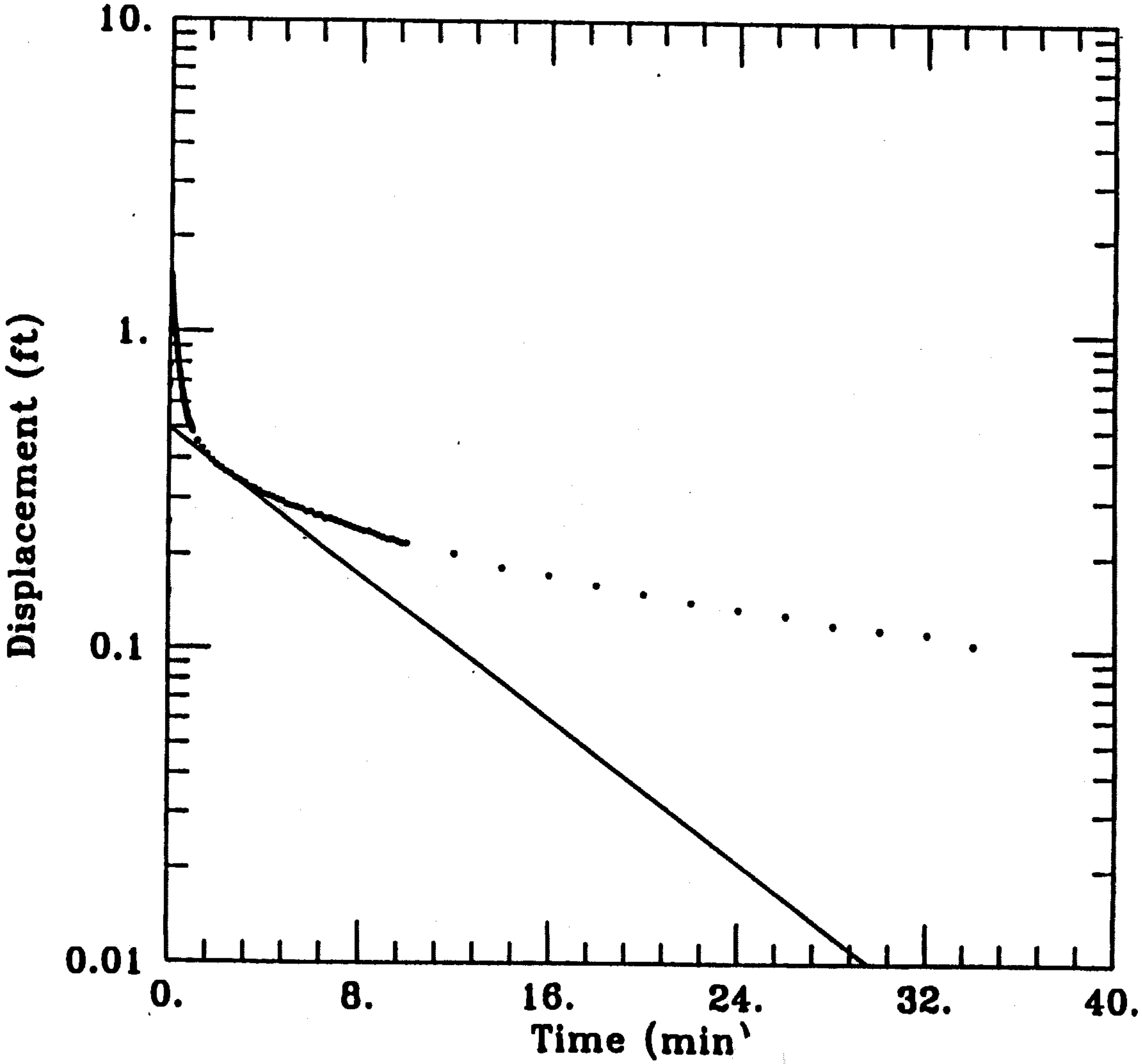
TEST DATA:
H0 = 1. ft
rc = 0.083 ft
rw = 0.3125 ft
L = 4. ft
b = 4. ft
H = 4. ft

PARAMETER ESTIMATES:
K = 0.0005749 ft/min
y0 = 0.4125 ft

AQTESOLV

Client: CLEAN	Company: E/A&H
Location: NAVAL BASE CHARLESTON	Project: 2906-08450

RISING HEAD SLUG TEST NBCF613001



DATA SET:
61301RIS.AQT
04/15/97

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: January 1997

TEST DATA:
H0 = 1. ft
rc = 0.083 ft
rw = 0.3125 ft
L = 4. ft
b = 4. ft
H = 4. ft

PARAMETER ESTIMATES:
K = 0.0009022 ft/min
y0 = 0.4989 ft

AQTESOL

APPENDIX D

RBCA CALCULATIONS

Minimum Construction Worker RBSLs

	Dermal RBSL mg/L	Incidental Ingestion RBSL mg/L	Inhalation RBSL mg/L	Minimum RBSL mg/L
Benzene	0.85	68.52	0.15	0.15
Toluene	23.98	5677.78	5.38	5.38
Ethylbenzene	6.05	2838.89	14.50	6.05
Xylene	102.33	56777.78	NA*	102.33
Naphthalene	1.63	1135.56	2.63	1.63
MTBE	25.92	141.94	293.44	25.92

*No inhalation reference dose is available for xylenes; therefore, no inhalation RBSL can be calculated.

Prepared By: Jeriosingavis

Reviewed By: Albert Jenkins

Construction Worker Dermal RBSLs

	Kow	MW	Kp	B	τ_{event}	c	b	t*	t_{event}	DAevent
			cm/hr	unitless	hr/event			hr	hr/event	
Benzene	199.5262315	78.1	0.11551543	0.392637855	2.87E-01	6.32E-01	6.03E-01	6.90E-01	1	eq 3.3
Toluene	537.0317964	92.1	0.259561335	0.958068292	3.44E-01	1.13E+00	1.31E+00	1.33E+00	1	eq 3.2
Ethylbenzene	1412.537545	106.2	0.569219802	2.256154884	4.13E-01	2.36E+00	4.39E+00	1.70E+00	1	eq 3.2
Xylene*	1584.893192	106.2	0.638675123	2.531447415	4.13E-01	2.63E+00	5.31E+00	1.72E+00	1	eq 3.2
Naphthalene	1995.262315	128.2	0.605452393	2.636638957	5.48E-01	2.73E+00	5.69E+00	2.29E+00	1	eq 3.2
MTBE	15.136	88.15	0.00769788	0.027797704	3.27E-01	3.52E-01	3.20E-01	7.85E-01	1	eq 3.3

	BW	AT	EV	ED	EF	SA	CSF derm	Rfd derm	Target	RBSL	RBSL
	kg	day	events/day	yrs	days/yr	cm^2	$(mg/kg\text{-}day)^{-1}$	mg/kg-day	Risk or HQ	mg/L	mg/L
Benzene	70	25550	1	1	90	4500	2.99E-02	NA	1.00E-06		8.52E-01
Toluene	70	365	1	1	90	4500	NA	1.60E-01	1.0	2.40E+01	
Ethylbenzene	70	365	1	1	90	4500	NA	9.70E-02	1.0	6.05E+00	
Xylene*	70	365	1	1	90	4500	NA	1.84E+00	1.0	1.02E+02	
Naphthalene	70	365	1	1	90	4500	NA	3.20E-02	1.0	1.63E+00	
MTBE	70	365	1	1	90	4500	NA	5.00E-03	1.0	2.59E+01	

* Kow and MW values for xylene, m-

Prepared By:

Reviewed By:

Construction Worker Incidental Ingestion RBSLs

	BW	AT	IR	ED	EF	Target	CSF oral	Rfd oral	RBSL
	kg	day	L/day	yrs	days/yr	Risk or HQ			mg/L
Benzene	70	25550	0.01	1	90	1.00E-06	2.90E-02		6.85E+01
Toluene	70	365	0.01	1	90	1.0	NA	2.00E-01	5677.778
Ethylbenzene	70	365	0.01	1	90	1.0	NA	1.00E-01	2838.889
Xylene	70	365	0.01	1	90	1.0	NA	2.00E+00	56777.78
Naphthalene	70	365	0.01	1	90	1.0	NA	4.00E-02	1135.556
MTBE	70	365	0.01	1	90	1.0	NA	5.00E-03	141.9444

Prepared By: [signature]

Reviewed By: Albert T. Jenkins

Construction Worker Inhalation RBSLs

Chemical			Dair	Dwater	H	θ_{acap}	θ_{wcap}	θ_{as}	θ_{ws}	θ_T	Deff-cap	Deff-s
			cm^2/s	cm^2/s	cm^3/cm^3	cm^3/cm^3	cm^3/cm^3	cm^3/cm^3	cm^3/cm^3	cm^3/cm^3	cm^2/s	cm^2/s
Benzene			0.093	1.10E-05	2.26E-01	0.038	0.342	0.33	0.15	0.48	1.35E-05	1.01E-02
Toluene			0.085	9.40E-06	3.01E-01	0.038	0.342	0.33	0.15	0.48	1.07E-05	9.20E-03
Ethylbenzene			0.076	8.50E-06	2.80E-01	0.038	0.342	0.33	0.15	0.48	9.85E-06	8.22E-03
Xylenes			0.072	8.50E-06	2.78E-01	0.038	0.342	0.33	0.15	0.48	9.55E-06	7.79E-03
Naphthalene			0.072	9.40E-06	2.00E-03	0.038	0.342	0.33	0.15	0.48	5.79E-04	7.83E-03
MTBE			0.102	1.05E-05	4.16E-02	0.038	0.342	0.33	0.15	0.48	3.90E-05	1.10E-02

Chemical			hcap	hv	Deff-ws	Uair	δair	Lgw	W	VFwamb	TR (carc)	HI (nonc)
			cm	cm	cm^2/s	cm/sec	cm	cm	cm	$mg/m^3/mg/L$		
Benzene			5	117	3.18E-04	225	200	122	1500	1.97E-05	1.00E-06	NA
Toluene			5	117	2.54E-04	225	200	122	1500	2.09E-05	NA	1
Ethylbenzene			5	117	2.34E-04	225	200	122	1500	1.79E-05	NA	1
Xylenes			5	117	2.27E-04	225	200	122	1500	1.72E-05	NA	1
Naphthalene			5	117	5.17E-03	225	200	122	1500	2.83E-06	NA	1
MTBE			5	117	8.79E-04	225	200	122	1500	9.99E-06	NA	1

Chemical	TR (carc)	HI (nonc)	BWadult	AT	Sfi (carc)	RfD (nonc)	IR air	EF	ED	RBSLair	H	RBSLwater
			kg	yr	$[mg/kg\text{-}day]^{-1}$	[mg/kg-day]	m^3/day	day/yr	yr	mg/m^3	cm^3/cm^3	mg/L
Benzene	1.00E-06	NA	70	70	2.90E-02	NA	20	90	1	3.43E-02	2.26E-01	0.15
Toluene	NA	1	70	1	NA	1.14E-01	20	90	1	1.62E+00	3.01E-01	5.38
Ethylbenzene	NA	1	70	1	NA	2.86E-01	20	90	1	4.06E+00	2.80E-01	14.50
Xylenes	NA	1	70	1	NA	NA*	20	90	1	NA*	2.78E-01	NA*
Naphthalene	NA	1	70	1	NA	3.71E-04	20	90	1	5.27E-03	2.00E-03	2.63
MTBE	NA	1	70	1	NA	8.60E-01	20	90	1	1.22E+01	4.16E-02	293.443

*No inhalation reference dose is available for xylenes; therefore, no RBSL can be calculated for xylene.

Prepared By:

Reviewed By:

IN-SITU SOIL RISK EVALUATION

SOUTH CAROLINA
Department of Health and Environmental Control (DHEC)

Site Data

SITE ID #	01782	COUNTY	Columbia
FACILITY NAME	Site 25, Building 1346		
STREET ADDRESS	Charleston Naval Complex, North Charleston, SC		

Soil Risk Evaluation Data

					Figure
TPH		993	mg/kg		
Soil % SAND (Estimated)		88	%		
Soil % CLAY (Estimated)		7	%		
Worst Case	Benzene	120	mg/kg	Cs	
Soil Analyses	Toluene	360	mg/kg	Cs	
	Ethylbenzene	560	mg/kg	Cs	
	Xylenes	2200	mg/kg	Cs	
	Naphthalene	217.9	mg/kg	Cs	
	MTBE	4.3	mg/kg	Cs	
Natural Organic Carbon Content		616	mg/kg	foc	
Average Annual Recharge		25	cm	Hw	
Distance from highest Soil Impact to water table		46	cm	L	
Bulk Density of Soil		1.6	g/cc	Bd	1
Wetting Front Suction		10	cm	Hf	2
Soil Hydraulic Conductivity		5.60E-03	cm/sec	Kf	3
Porosity		0.45	decimal %	Φ	4
Residual Water Content		0.04	decimal %	Wr	5

List possible human exposure pathways from surface soil.
Soil leaching to groundwater - utility worker in utility trench.

IN-SITU SOIL RISK EVALUATION

SOIL LEACHABILITY MODEL FOR MTBE

RISK-BASED CORRECTIVE ACTION FOR PETROLEUM RELEASES

SITE INFORMATION:

Site:	Site 25, Building 1346
Location:	Charleston Naval Complex, North Charleston, SC

REFERENCES:

(1) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 1.
(2) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Table 2.
(3) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Input Parameters.
(4) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Table 1.
(5) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 2.
(6) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 3.
(7) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 4.
(8) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 5.

INPUT:

COC	Chemical of Concern		MTBE
Bd	Soil Bulk Density (1)	g/cm3	1.6
Crsbl	Risk Based Screening Level	mg/L	25.92
Cs	Concentration of COC in soil	mg/kg	217.9
DAF	Dilution/Attenuation Factor (2)	unitless	8
foc	Organic Carbon Content in Soil (3)	mg/kg	616
H'	Henry's Law Constant (4)	unitless	0.04
Hf	Wetting front suction head (always negative) (5)	cm	-10
Hw	Average Annual Recharge (3)	cm	25
Kf	Soil Hydraulic Conductivity (6)	cm/s	0.0056
Koc	Soil/Water Partioning Coefficient (2)	ml/g	12
L	Depth between soil sample with greatest COC concentration to groundwater.	cm	46
Ø	Porosity (7)	unitless	0.45
t1/2	Biodegradation "half life" (2)	days	183
TPH	Total Petroleum Hydrocarbons, EPA Method 3550	mg/kg	993
Wr	Residual Water Content (8)	volume fraction	0.04

CALCULATIONS:

Equation Set I - Determine soil pore water concentration resulting from physical partioning (Cw).

Step 1 - Calculate the total organic carbon content (fcs) of the soil.

fcs = (foc + TPH/1.724)*1E-6 = **0.0012** decimal %

Step 2 - Calculate the concentration of COC in soil pore water (Cw) directly in contact with the contaminate soil.

Cw = Cs*((Wr *1g/cc+Bd)/((Bd*Koc*fcs)+Wr+((ø-Wr)*H'))) = **176.55** mg/l

Equation Set II - Determine the velocity of the soil pore water (Vw)

Step 1 - Calculate the air filled porosity (f) in decimal percent.

f = ø - Wr = **0.41** decimal %

Step 2 - Determine the time for water to percolate through the vadose zone soil (from depth of worst case soil sample to the water table at site).

t = (f/Kf)*(L-(Hw-Hf))*(ln(Hw+((L-Hf)/(Hw-Hf)))) = **1,218** seconds

Step 3 - Determine the velocity of the water (Vw) in feet per year.

Vw = (L/30.48cm/ft)/(t/31,500,000sec/year) = **39042** ft/year

Equation Set III - Determine the organic retardation effect (Vc) of the contaminant.

Step 1 - Calculate the soil/water distribution coefficient (Kd) (ml/g) for uncontaminated soil.

Kd = Koc*foc*1E-6 = **0.007084** ml/g

Step 2 - Calculate the retardation effect of natural soil organic matter on COC migration.

Vc = Vw*(1+((Bd*Kd)/ø)) = **38,082** ft/year

Equation Set IV - Determine biodegradation rates and provide final COC concentration (Cf) at depth of concern.

Step 1 - Calculate the time (Tc) in days required for the COC to reach groundwater.

Tc = 365 day/yr*((L/30.48cm/ft)/Vc) = 0.01 days

Step 2 - Calculate estimated concentration of COC in the soil pore water (Cp) necessary to protect groundwater.

Cp = 10^(log (Crsbl)+((Tc/2.3)*(0.693/t1/2))) = 25.92 mg/l

COC concentration in soil pore water (Cp) is greater than Crsbl, therefore the SSTL must be calculated.

Equation Set V - Calculate the Site Specific Target Level (SSTL) for the COC in soil.

Csstl for MTBE in soil = Cp*DAF*(((Bd*Koc*fcs)+Wr+(F*'H'''))/(Wr*1g/cc+Bd)) = 9.987784 mg/kg

PREPARED BY:____________________

Date

CHECKED BY:____________________

Date

IN-SITU SOIL RISK EVALUATION

SOUTH CAROLINA
Department of Health and Environmental Control (DHEC)

Site Data

SITE ID # 01782
FACILITY NAME Site 25, Building 1346

Instructions

Provide results, separately, for each constituent in the worst case soil analysis.

Data

List Constituent: MTBE
(BTEX, Napth.)

				Table
Bioremediation "half-life"	183	days	t 1/2	C2
Soil/water partitioning coefficient	12	ml/g	K oc	C2

Results

				Equation Set	Step
Total Organic Carbon Content	0.0012	decimal %	f cs	I	1
Leachate Concentration	176.552	mg/l	C w	I	2
Air Filled Porosity	0.41	decimal %	f	II	1
Infiltration Rate Time	1,218	seconds	t	II	2
Velocity of Water	39,042	ft/year	V w	II	3
Soil/Water Distribution Coefficient	0.01	ml/g	K d	III	1
Contaminant Percolation Rate	38,082	ft/year	V c	III	2
Time to Reach Groundwater	0	days	T c	IV	1
Concentration reaching Groundwater	25.92	mg/l	C p	IV	2
Site Specific Target Level	**9.9878**	mg/kg	C sstl	V	

Conclusions

Does concentration of chemical of concern in soil exceed SSTL? YES

Risk of Human Exposure due to contaminated soil.

X YES ______ NO

IN-SITU SOIL RISK EVALUATION

SOIL LEACHABILITY MODEL FOR BENZENE

RISK-BASED CORRECTIVE ACTION FOR PETROLEUM RELEASES

SITE INFORMATION:

Site:	Site 25, Building 1346
Location:	Charleston Naval Complex, North Charleston, SC

REFERENCES:

(1) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 1.
(2) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Table 2.
(3) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Input Parameters.
(4) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Table 1.
(5) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 2.
(6) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 3.
(7) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 4.
(8) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 5.

INPUT:

COC	Chemical of Concem		BENZENE
Bd	Soil Bulk Density (1)	g/cm3	1.6
Crsbl	Risk Based Screening Level	mg/L	0.15
Cs	Concentration of COC in soil	mg/kg	120
DAF	Dilution/Attenuation Factor (2)	unitless	8
foc	Organic Carbon Content in Soil (3)	mg/kg	616
H'	Henry's Law Constant (4)	unitless	0.23
Hf	Wetting front suction head (always negative) (5)	cm	-10
Hw	Average Annual Recharge (3)	cm	25.00
Kf	Soil Hydraulic Conductivity (6)	cm/s	5.60E-03
Koc	Soil/Water Partioning Coefficient (2)	ml/g	81
L	Depth between soil sample with greatest COC concentration to groundwater.	cm	46
Φ	Porosity (7)	unitless	0.45
t1/2	Biodegradation "half life" (2)	days	16
TPH	Total Petroleum Hydrocarbons, EPA Method 3550	mg/kg	993
Wr	Residual Water Content (8)	volume fraction	0.04

CALCULATIONS:

Equation Set I - Determine soil pore water concentration resulting from physical partioning (Cw).

Step 1 - Calculate the total organic carbon content (fcs) of the soil.

fcs = (foc + TPH/1.724)*1E-6 = 0.0012 decimal %

Step 2 - Calculate the concentration of COC in soil pore water (Cw) directly in contact with the contaminate soil.

Cw = Cs*((Wr *1g/cc+Bd)/((Bd*Koc*fcs)+Wr+((ø-Wr)*H'))) = 685.3766 mg/l

Equation Set II - Determine the velocity of the soil pore water (Vw)

Step 1 - Calculate the air filled porosity (f) in decimal percent.

f = Ø - Wr = 0.41 decimal %

Step 2 - Determine the time for water to percolate through the vadose zone soil (from depth of worst case soil sample to the water table at site).

t = (f/Kf)*(L-((Hw-Hf)*(ln((Hw+L-Hf)/(Hw-Hf))))) = 1,218 seconds

Step 3 - Determine the velocity of the water (Vw) in feet per year.

Vw = (L/30.48cm/ft)/(t/31,500,000sec/year) = 39,042 ft/year

Equation Set III - Determine the organic retardation effect (Vc) of the contaminant.

Step 1 - Calculate the soil/water distribution coefficient (Kd) (ml/g) for uncontaminated soil.

Kd = Koc*foc*1E-6 = 0.049896 ml/g

Step 2 - Calculate the retardation effect of natural soil organic matter on COC migration.

Vc = Vw/(1+((Bd*Kd)/ø)) = 33,159 ft/year

Equation Set IV - Determine biodegradation rates and provide final COC concentration (Cf) at depth of concern.

Step 1 - Calculate the time (Tc) in days required for the COC to reach groundwater.

Tc = 365 day/yr*((L/30.48cm/ft)/Vc) = 0.02 days

Step 2 - Calculate estimated concentration of COC in the soil pore water (Cp) necessary to protect groundwater.

Cp = 10^(log (Crsbl)+((Tc/2.3)*(0.693/t1/2))) = 0.1501 mg/l

COC concentration in soil pore water (Cw) is less than concentration necessary to protect groundwater (Cp). Not necessary to calculate SSTL

Equation Set V - Calculate the Site Specific Target Level (SSTL) for the COC in soil.

Csstl for BENZENE in soil = Cp*DAF*(((Bd*Koc*fcs)+Wr+(F*'H''))/(Wr*1g/cc+Bd)) = 0.210255 mg/kg

PREPARED BY: ______________________ **Date**

CHECKED BY: ______________________ **Date**

IN-SITU SOIL RISK EVALUATION

SOUTH CAROLINA
Department of Health and Environmental Control (DHEC)

Site Data

SITE ID # 01782
FACILITY NAME Site 25, Building 1346

Instructions

Provide results, separately, for each constituent in the worst case soil analysis.

Data

List Constituent: BENZENE
(BTEX, Napth.)

				Table
Bioremediation "half-life"	16	days	t 1/2	C2
Soil/water partitioning coefficient	81	ml/g	K oc	C2

Results

				Equation Set	Step
Total Organic Carbon Content	0.0012	decimal %	f cs	I	1
Leachate Concentration	685.377	mg/l	C w	I	2
Air Filled Porosity	0.41	decimal %	f	II	1
Infiltration Rate Time	1,218	seconds	t	II	2
Velocity of Water	39,042	ft/year	V w	II	3
Soil/Water Distribution Coefficient	0.0499	ml/g	K d	III	1
Contaminant Percolation Rate	33,159	ft/year	V c	III	2
Time to Reach Groundwater	0.02	days	T c	IV	1
Concentration reaching Groundwater	0.1501	mg/l	C p	IV	2
Site Specific Target Level	**0.2103**	mg/kg	C sstl	V	

Conclusions

Does concentration of chemical of concern in soil exceed SSTL? YES

Risk of Human Exposure due to contaminated soil.

X YES ______ NO

IN-SITU SOIL RISK EVALUATION

SOIL LEACHABILITY MODEL FOR NAPHTHALENE

RISK-BASED CORRECTIVE ACTION FOR PETROLEUM RELEASES

SITE INFORMATION:

Site:	Site 25, Building 1346
Location:	Charleston Naval Complex, North Charleston, SC

REFERENCES:

(1) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 1.
(2) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Table 2.
(3) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Input Parameters.
(4) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Table 1.
(5) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 2.
(6) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 3.
(7) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 4.
(8) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 5.

INPUT:

COC	Chemical of Concern		NAPHTHALENE
Bd	Soil Bulk Density (1)	g/cm3	1.6
Crsbl	Risk Based Screening Level	mg/L	1.63
Cs	Concentration of COC in soil	mg/kg	217.9
DAF	Dilution/Attenuation Factor (2)	unitless	8
foc	Organic Carbon Content in Soil (3)	mg/kg	616
H'	Henry's Law Constant (4)	unitless	0.002
Hf	Wetting front suction head (always negative) (5)	cm	-10
Hw	Average Annual Recharge (3)	cm	25
Kf	Soil Hydraulic Conductivity (6)	cm/s	0.0056
Koc	Soil/Water Partioning Coefficient (2)	ml/g	1543
L	Depth between soil sample with greatest COC concentration to groundwater.	cm	46
ø	Porosity (7)	unitless	0.45
t1/2	Biodegradation "half life" (2)	days	48
TPH	Total Petroleum Hydrocarbons, EPA Method 3550	mg/kg	993
Wr	Residual Water Content (8)	volume fraction	0.04

CALCULATIONS:

Equation Set I - Determine soil pore water concentration resulting from physical partioning (Cw).

Step 1 - Calculate the total organic carbon content (fcs) of the soil.

fcs = (foc + TPH/1.724)*1E-6 = 0.0012 decimal %

Step 2 - Calculate the concentration of COC in soil pore water (Cw) directly in contact with the contaminate soil.

Cw = Cs*((Wr *1g/cc + Bd)/((Bd*Koc*fcs) + Wr + ((ø-Wr)*H'))) = 4.67 mg/l

Equation Set II - Determine the velocity of the soil pore water (Vw)

Step 1 - Calculate the air filled porosity (f) in decimal percent.

f = ø - Wr = 0.41 decimal %

Step 2 - Determine the time for water to percolate through the vadose zone soil (from depth of worst case soil sample to the water table at site).

t = (f/Kf)*(L-(Hw-Hf))*(ln(Hw + ((L-Hf)/(Hw-Hf)))) = 1,218 seconds

Step 3 - Determine the velocity of the water (Vw) in feet per year.

Vw = (L/30.48cm/ft)/(t/31,500,000sec/year) = 39042 ft/year

Equation Set III - Determine the organic retardation effect (Vc) of the contaminant.

Step 1 - Calculate the soil/water distribution coefficient (Kd) (ml/g) for uncontaminated soil.

Kd = Koc*foc*1E-6 = 0.950488 ml/g

Step 2 - Calculate the retardation effect of natural soil organic matter on COC migration.

Vc = Vw*(1 + ((Bd*Kd)/ø)) = 8,915 ft/year

Equation Set IV - Determine biodegradation rates and provide final COC concentration (Cf) at depth of concern.

Step 1 - Calculate the time (Tc) in days required for the COC to reach groundwater.

Tc = 365 day/yr*((L/30.48cm/ft)/Vc) = 0.06 days

Step 2 - Calculate estimated concentration of COC in the soil pore water (Cp) necessary to protect groundwater.

Cp = 10^(log (Crsbl)+((Tc/2.3)*(0.693/t1/2))) = 1.63 mg/l

COC concentration in soil pore water (Cp) is greater than Crsbl, therefore the SSTL must be calculated.

Equation Set V - Calculate the Site Specific Target Level (SSTL) for the COC in soil.

Csstl for IAPHTHALENE in soil = Cp*DAF*(((Bd*Koc*fcs)+Wr+(F*'H'''))/(Wr*1g/cc+Bd)) = 23.744418 mg/kg

PREPARED BY: ____________________

Date

CHECKED BY: ____________________

Date

IN-SITU SOIL RISK EVALUATION

SOUTH CAROLINA
Department of Health and Environmental Control (DHEC)

Site Data

SITE ID # 01782
FACILITY NAME Site 25, Building 1346

Instructions

Provide results, separately, for each constituent in the worst case soil analysis.

Data

List Constituent: NAPHTHALENE
(BTEX, Napth.)

				Table
Bioremediation "half-life"	48	days	t 1/2	C2
Soil/water partitioning coefficient	1543	ml/g	K oc	C2

Results

				Equation Set	Step
Total Organic Carbon Content	0.0012	decimal %	f cs	I	1
Leachate Concentration	4.674	mg/l	C w	I	2
Air Filled Porosity	0.41	decimal %	f	II	1
Infiltration Rate Time	1,218	seconds	t	II	2
Velocity of Water	39,042	ft/year	V w	II	3
Soil/Water Distribution Coefficient	0.95	ml/g	K d	III	1
Contaminant Percolation Rate	8,915	ft/year	V c	III	2
Time to Reach Groundwater	0	days	T c	IV	1
Concentration reaching Groundwater	1.63	mg/l	C p	IV	2
Site Specific Target Level	**24**	mg/kg	C sstl	V	

Conclusions

Does concentration of chemical of concern in soil exceed SSTL? YES

Risk of Human Exposure due to contaminated soil.

X **YES** ______ **NO**

IN-SITU SOIL RISK EVALUATION

SOIL LEACHABILITY MODEL FOR TOLUENE

RISK-BASED CORRECTIVE ACTION FOR PETROLEUM RELEASES

SITE INFORMATION:

Site:	Site 25, Building 1346
Location:	Charleston Naval Complex, North Charleston, SC

REFERENCES:

(1) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 1.
(2) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Table 2.
(3) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Input Parameters.
(4) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Table 1.
(5) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 2.
(6) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 3.
(7) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 4.
(8) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 5.

INPUT:

COC	Chemical of Concern		TOLUENE
Bd	Soil Bulk Density (1)	g/cm3	1.6
Crsbl	Risk Based Screening Level	mg/L	5.38
Cs	Concentration of COC in soil	mg/kg	360
DAF	Dilution/Attenuation Factor (2)	unitless	8
foc	Organic Carbon Content in Soil (3)	mg/kg	616
H'	Henry's Law Constant (4)	unitless	0.30
Hf	Wetting front suction head (always negative) (5)	cm	-10
Hw	Average Annual Recharge (3)	cm	25
Kf	Soil Hydraulic Conductivity (6)	cm/s	0.0056
Koc	Soil/Water Partioning Coefficient (2)	ml/g	133
L	Depth between soil sample with greatest COC concentration to groundwater.	cm	46
Ø	Porosity (7)	unitless	0.45
t1/2	Biodegradation "half life" (2)	days	22
TPH	Total Petroleum Hydrocarbons, EPA Method 3550	mg/kg	993
Wr	Residual Water Content (8)	volume fraction	0.04

CALCULATIONS:

Equation Set I - Determine soil pore water concentration resulting from physical partioning (Cw).

Step 1 - Calculate the total organic carbon content (fcs) of the soil.

fcs = (foc + TPH/1.724)*1E-6 = **0.0012** decimal %

Step 2 - Calculate the concentration of COC in soil pore water (Cw) directly in contact with the contaminate soil.

Cw = Cs*((Wr * 1g/cc + Bd)/((Bd*Koc*fcs) + Wr + ((ø-Wr)*H'))) = **55** mg/l

Equation Set II - Determine the velocity of the soil pore water (Vw)

Step 1 - Calculate the air filled porosity (f) in decimal percent.

f = ø - Wr = **0.41** decimal %

Step 2 - Determine the time for water to percolate through the vadose zone soil (from depth of worst case soil sample to the water table at site).

t = (f/Kf)*(L-(Hw-Hf))*(ln(Hw + ((L-Hf)/(Hw-Hf)))) = **1,218** seconds

Step 3 - Determine the velocity of the water (Vw) in feet per year.

Vw = (L/30.48cm/ft)/(t/31,500,000sec/year) = **39,042** ft/year

Equation Set III - Determine the organic retardation effect (Vc) of the contaminant.

Step 1 - Calculate the soil/water distribution coefficient (Kd) (ml/g) for uncontaminated soil.

Kd = Koc*foc*1E-6 = **0.081928** ml/g

Step 2 - Calculate the retardation effect of natural soil organic matter on COC migration.

Vc = Vw*(1 + ((Bd*Kd)/ø)) = **30,234** ft/year

Equation Set IV - Determine biodegradation rates and provide final COC concentration (Cf) at depth of concern.

Step 1 - Calculate the time (Tc) in days required for the COC to reach groundwater.

Tc = 365 day/yr*((L/30.48cm/ft)/Vc) = 0.02 days

Step 2 - Calculate estimated concentration of COC in the soil pore water (Cp) necessary to protect groundwater.

Cp = 10^(log (Crsbl)+((Tc/2.3)*(0.693/t1/2))) = 5.3831 mg/l

COC concentration in soil pore water (Cp) is greater than Crsbl, therefore the SSTL must be calculated.

Equation Set V - Calculate the Site Specific Target Level (SSTL) for the COC in soil.

Csstl for TOLUENE in soil = Cp*DAF*(((Bd*Koc*fcs)+Wr+(F*'H''))/(Wr*1g/cc+Bd)) = 10.951686 mg/kg

PREPARED BY:________________________

Date

CHECKED BY:________________________

Date

IN-SITU SOIL RISK EVALUATION

SOUTH CAROLINA

Department of Health and Environmental Control (DHEC)

Site Data

SITE ID # 01782

FACILITY NAME Site 25, Building 1346

Instructions

Provide results, separately, for each constituent in the worst case soil analysis.

Data

List Constituent: TOLUENE

(BTEX, Napth.)

				Table
Bioremediation "half-life"	22	days	t 1/2	C2
Soil/water partitioning coefficient	133	ml/g	K oc	C2

Results

				Equation Set	Step
Total Organic Carbon Content	0.0012	decimal %	f cs	I	1
Leachate Concentration	55.243	mg/l	C w	I	2
Air Filled Porosity	0.41	decimal %	f	II	1
Infiltration Rate Time	1,218	seconds	t	II	2
Velocity of Water	39,042	ft/year	V w	II	3
Soil/Water Distribution Coefficient	0.0819	ml/g	K d	III	1
Contaminant Percolation Rate	30,234	ft/year	V c	III	2
Time to Reach Groundwater	0	days	T c	IV	1
Concentration reaching Groundwater	5	mg/l	Cp	IV	2
Site Specific Target Level	**11**	mg/kg	C sstl	V	

Conclusions

Does concentration of chemical of concern in soil exceed SSTL? YES

Risk of Human Exposure due to contaminated soil.

X **YES** _____ **NO**

IN-SITU SOIL RISK EVALUATION

SOIL LEACHABILITY MODEL FOR ETHYLBENZENE

RISK-BASED CORRECTIVE ACTION FOR PETROLEUM RELEASES

SITE INFORMATION:

Site:	Site 25, Building 1346
Location:	Charleston Naval Complex, North Charleston, SC

REFERENCES:

(1) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 1.
(2) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Table 2.
(3) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Input Parameters.
(4) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Table 1.
(5) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 2.
(6) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 3.
(7) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 4.
(8) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 5.

INPUT:

COC	Chemical of Concern		ETHYLBENZENE
Bd	Soil Bulk Density (1)	g/cm3	1.6
Crsbl	Risk Based Screening Level	mg/L	6.05
Cs	Concentration of COC in soil	mg/kg	560
DAF	Dilution/Attenuation Factor (2)	unitless	8
foc	Organic Carbon Content in Soil (3)	mg/kg	616
H'	Henry's Law Constant (4)	unitless	0.28
Hf	Wetting front suction head (always negative) (5)	cm	-10
Hw	Average Annual Recharge (3)	cm	25
Kf	Soil Hydraulic Conductivity (6)	cm/s	0.0056
Koc	Soil/Water Partioning Coefficient (2)	ml/g	176
L	Depth between soil sample with greatest COC concentration to groundwater.	cm	46
Ø	Porosity (7)	unitless	0.45
t1/2	Biodegradation "half life" (2)	days	10
TPH	Total Petroleum Hydrocarbons, EPA Method 3550	mg/kg	993
Wr	Residual Water Content (8)	volume fraction	0.04

CALCULATIONS:

Equation Set I - Determine soil pore water concentration resulting from physical partioning (Cw).

Step 1 - Calculate the total organic carbon content (fcs) of the soil.

fcs = (foc + TPH/1.724)*1E-6 = **0.0012** decimal %

Step 2 - Calculate the concentration of COC in soil pore water (Cw) directly in contact with the contaminate soil.

Cw = Cs*((Wr *1g/cc+Bd)/((Bd*Koc*fcs)+Wr+((ø-Wr)*H'))) = **73.0737682** mg/l

Equation Set II - Determine the velocity of the soil pore water (Vw)

Step 1 - Calculate the air filled porosity (f) in decimal percent.

f = Ø - Wr = **0.41** decimal %

Step 2 - Determine the time for water to percolate through the vadose zone soil (from depth of worst case soil sample to the water table at site).

t = (f/Kf)*(L-(Hw-Hf))*(ln(Hw+((L-Hf)/(Hw-Hf)))) = **1,218** seconds

Step 3 - Determine the velocity of the water (Vw) in feet per year.

Vw = (L/30.48cm/ft)/(t/31,500,000sec/year) = **39,042** ft/year

Equation Set III - Determine the organic retardation effect (Vc) of the contaminant.

Step 1 - Calculate the soil/water distribution coefficient (Kd) (ml/g) for uncontaminated soil.

Kd = Koc*foc*1E-6 = **0.108416** ml/g

Step 2 - Calculate the retardation effect of natural soil organic matter on COC migration.

Vc = Vw*(1+((Bd*Kd)/ø)) = **28,179** ft/year

Equation Set IV - Determine biodegradation rates and provide final COC concentration (Cf) at depth of concern.

Step 1 - Calculate the time (Tc) in days required for the COC to reach groundwater.

Tc = 365 day/yr*((L/30.48cm/ft)/Vc) = 0.02 days

Step 2 - Calculate estimated concentration of COC in the soil pore water (Cp) necessary to protect groundwater.

Cp = 10^(log (Crsbl)+((Tc/2.3)*(0.693/t1/2))) = 6.06 mg/l

COC concentration in soil pore water (Cp) is greater than Crsbl, therefore the SSTL must be calculated.

Equation Set V - Calculate the Site Specific Target Level (SSTL) for the COC in soil.

Csstl for THYLBENZENE in soil = Cp*DAF*(((Bd*Koc*fcs)+Wr+(F*'H'''))/(Wr*1g/cc+Bd)) = 14.494292 mg/kg

PREPARED BY:____________________

Date

CHECKED BY:____________________

Date

IN-SITU SOIL RISK EVALUATION

SOUTH CAROLINA
Department of Health and Environmental Control (DHEC)

Site Data

SITE ID # 01782
FACILITY NAME Site 25, Building 1346

Instructions

Provide results, separately, for each constituent in the worst case soil analysis.

Data

List Constituent: ETHYLBENZENE
(BTEX, Napth.)

				Table
Bioremediation "half-life"	10	days	t 1/2	C2
Soil/water partitioning coefficient	176	ml/g	K oc	C2

Results

				Equation Set	Step
Total Organic Carbon Content	0.0012	decimal %	f cs	I	1
Leachate Concentration	7.31E+01	mg/l	C w	I	2
Air Filled Porosity	0.41	decimal %	f	II	1
Infiltration Rate Time	1,218	seconds	t	II	2
Velocity of Water	39,042	ft/year	V w	II	3
Soil/Water Distribution Coefficient	0.1084	ml/g	K d	III	1
Contaminant Percolation Rate	28,179	ft/year	V c	III	2
Time to Reach Groundwater	0	days	T c	IV	1
Concentration reaching Groundwater	6	mg/l	C p	IV	2
Site Specific Target Level	**14**	mg/kg	C sstl	V	

Conclusions

Does concentration of chemical of concern in soil exceed SSTL? YES

Risk of Human Exposure due to contaminated soil.

X **YES** ______ **NO**

IN-SITU SOIL RISK EVALUATION

SOIL LEACHABILITY MODEL FOR XYLENES

RISK-BASED CORRECTIVE ACTION FOR PETROLEUM RELEASES

SITE INFORMATION:

Site:	Site 25, Building 1346
Location:	Charleston Naval Complex, North Charleston, SC

REFERENCES:

(1) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 1.
(2) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Table 2.
(3) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Input Parameters.
(4) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Table 1.
(5) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 2.
(6) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 3.
(7) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 4.
(8) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 5.

INPUT:

COC	Chemical of Concern		XYLENES
Bd	Soil Bulk Density (1)	g/cm3	1.6
Crsbl	Risk Based Screening Level	mg/L	102.33
Cs	Concentration of COC in soil	mg/kg	2200
DAF	Dilution/Attenuation Factor (2)	unitless	8
foc	Organic Carbon Content in Soil (3)	mg/kg	616
H'	Henry's Law Constant (4)	unitless	0.28
Hf	Wetting front suction head (always negative) (5)	cm	-10
Hw	Average Annual Recharge (3)	cm	25
Kf	Soil Hydraulic Conductivity (6)	cm/s	0.0056
Koc	Soil/Water Partioning Coefficient (2)	ml/g	639
L	Depth between soil sample with greatest COC concentration to groundwater.	cm	46
ø	Porosity (7)	unitless	0.45
t1/2	Biodegradation "half life" (2)	days	28
TPH	Total Petroleum Hydrocarbons, EPA Method 3550	mg/kg	993
Wr	Residual Water Content (8)	volume fraction	0.04

CALCULATIONS:

Equation Set I - Determine soil pore water concentration resulting from physical partioning (Cw).

Step 1 - Calculate the total organic carbon content (fcs) of the soil.

fcs = (foc + TPH/1.724)*1E-6 = **0.0012** decimal %

Step 2 - Calculate the concentration of COC in soil pore water (Cw) directly in contact with the contaminate soil.

Cw = Cs*((Wr *1g/cc + Bd)/((Bd*Koc*fcs) + Wr + ((ø-Wr)*H'))) = **103** mg/l

Equation Set II - Determine the velocity of the soil pore water (Vw)

Step 1 - Calculate the air filled porosity (f) in decimal percent.

f = ø - Wr = **0.41** decimal %

Step 2 - Determine the time for water to percolate through the vadose zone soil (from depth of worst case soil sample to the water table at site).

t = (f/Kf)*(L-(Hw-Hf))*(ln(Hw + ((L-Hf)/(Hw-Hf)))) = **1,218** seconds

Step 3 - Determine the velocity of the water (Vw) in feet per year.

Vw = (L/30.48cm/ft)/(t/31,500,000sec/year) = **39,042** ft/year

Equation Set III - Determine the organic retardation effect (Vc) of the contaminant.

Step 1 - Calculate the soil/water distribution coefficient (Kd) (ml/g) for uncontaminated soil.

Kd = Koc*foc*1E-6 = **0.393624** ml/g

Step 2 - Calculate the retardation effect of natural soil organic matter on COC migration.

Vc = Vw*(1 + ((Bd*Kd)/ø)) = **16,270** ft/year

Equation Set IV - Determine biodegradation rates and provide final COC concentration (Cf) at depth of concern.

Step 1 - Calculate the time (Tc) in days required for the COC to reach groundwater.

Tc = 365 day/yr*((L/30.48cm/ft)/Vc) = 0.03 days

Step 2 - Calculate estimated concentration of COC in the soil pore water (Cp) necessary to protect groundwater.

Cp = 10^(log (Crsbl)+((Tc/2.3)*(0.693/t1/2))) = 102.42 mg/l

COC concentration in soil pore water (Cp) is greater than Crsbl, therefore the SSTL must be calculated.

Equation Set V - Calculate the Site Specific Target Level (SSTL) for the COC in soil.

Csstl for XYLENES in soil = Cp*DAF*(((Bd*Koc*fcs)+Wr+(F*'H''))/(Wr*1g/cc+Bd)) = 685.770015 mg/kg

PREPARED BY:________________________

Date

CHECKED BY:________________________

Date

IN-SITU SOIL RISK EVALUATION

SOUTH CAROLINA
Department of Health and Environmental Control (DHEC)

Site Data

SITE ID # 01782
FACILITY NAME Site 25, Building 1346

Instructions

Provide results, separately, for each constituent in the worst case soil analysis.

Data

List Constituent: XYLENES
(BTEX, Napth.)

				Table
Bioremediation "half-life"	28	days	t 1/2	C2
Soil/water partitioning coefficient	639	ml/g	K oc	C2

Results

				Equation Set	Step
Total Organic Carbon Content	0.0012	decimal %	f cs	I	1
Leachate Concentration	102.5741	mg/l	C w	I	2
Air Filled Porosity	0.41	decimal %	f	II	1
Infiltration Rate Time	1,218	seconds	t	II	2
Velocity of Water	39,042	ft/year	V w	II	3
Soil/Water Distribution Coefficient	0.3936	ml/g	K d	III	1
Contaminant Percolation Rate	16,270	ft/year	V c	III	2
Time to Reach Groundwater	0	days	T c	IV	1
Concentration reaching Groundwater	102	mg/l	C p	IV	2
Site Specific Target Level	**686**	mg/kg	C sstl	V	

Conclusions

Does concentration of chemical of concern in soil exceed SSTL? YES

Risk of Human Exposure due to contaminated soil.

X YES ______ NO

IN-SITU SOIL RISK EVALUATION

Site Specific Target Level Calculations for Soil: Construction Worker Inhalation of Volatiles from Soil

Parameter Descriptions:	Units	Parameter Descriptions:	Units
ABS = Absorption Fraction		ET = Exposure Time	hours/day
AF = Adherence Factor of Soil to Skin	mg/cm^2	FI = Fraction Ingested	
AT = Averaging Time	days	HQ = Hazard Quotient	
BW = Body Weight	kg	IR = Inhalation or Ingestion Rate	m^3/hour or mg/day
CF = Conversion Factor		RBSL = Risk Based Sceeening Level	
CSF_D = Dermal Cancer Slope Factor	(mg/kg-day)$^{-1}$	RfD_D = Dermal Reference Dose	mg/kg-day
CSF_I = Inhalation Cancer Slope Factor	(mg/kg-day)$^{-1}$	RfD_I = Inhalation Reference Dose	mg/kg-day
CSF_O = Oral Cancer Slope Factor	(mg/kg-day)$^{-1}$	RfD_O = Oral Reference Dose	mg/kg-day
ED = Exposure Duration	year	SA = Skin Surface Area Available for Contact	cm^2
EF = Exposure Frequency	days/year	VF_{SS} = Volatilization Factor	
ELCR = Excess Lifetime Cancer Risk			

Construction Worker Inhalation of Vapor from Soil (Outdoor)

Constituent	IR	ET	EF	ED	AT	BW
	m^3/hour	hours/day	days/year	years	days	kg
Benzene	0.83	8	90	1	25550	70
Toluene	0.83	8	90	1	87.6	70
Ethylbenzene	0.83	8	90	1	87.6	70
Xylenes	0.83	8	90	1	87.6	70
Napthalene	0.83	8	90	1	87.6	70

Constituent	CSF_I	RfD_I	Target ELCR	Target HQ	$RBSL_{AIR}$	VF_{SS}	$RBSL_{SOIL}$
	(mg/kg-day)$^{-1}$	mg/kg-day			mg/m^3	mg/m^3 / mg/kg	mg/kg
Benzene	0.029	NA	1.0E-06	NA	0.102787	1.31E-05	7,853
Toluene	NA	0.11	NA	1.0E+00	1.1242	1.31E-05	85,887
Ethylbenzene	NA	0.29	NA	1.0E+00	2.9638	1.31E-05	226,430
Xylenes	NA	NA	NA	1.0E+00	NA	1.31E-05	NA
Napthalene	NA	0.004	NA	1.0E+00	0.04088	1.31E-05	3,123

Source: ASTM (American Society for Testing and Materials), 1997. *Standard Guide for Risk-Based Corrective Action* applied at Petroleum Release Sites: E 1739 - 95E1, Annual Book of ASTM Standards, West Conshohocken, PA

HYDROCARBON CONSTITUENT CONCENTRATIONS IN WATER BASED ON RAOULT'S LAW

Parameter Descriptions:	Units
C_W = Aqueous Solubility of Organic Constituents Dissolved from Product	mg/L
C_F = Concentration of the Constituent in the Fuel	mg/L
K_{FW} = Fuel/Water Partition Coefficient	
P_F = Density of the Product	g/mL
MW_F = Molecular Weight of the Product	g/mol
C_{SAT} = Aqueous Solubility of the Constituent	mol/L
MW_C = Molecular Weight of the Constituent	g/mol
$K_{FW} = (10^3(mL/L)\ p_F)/(MW_F * C_{SAT}/(MW_C * 1000))$	
$C_W = C_F/K_{FW}$	mg/L

Source: "Solubility, Sorption, and Transport of Hydrophobic Organic Chemicals in Complex Mixtures," EPA Environmental Research Brief, EPA/600/M-91/009, Robert S. Kerr Environmental Research Laboratory, ADA, Oklahoma.

Key Assumptions:

MW_F : Molecular Weight of Weathered Product, Source: "A Practical Approach to the Design, Operation, and Monitoring of In-Situ Soil Venting Systems", Shell Development/Shell Oil Company, Houston, Texas.

P_F : Density of the Product, Source: Conoco Material Safety Data Sheet for unleaded gasoline.

Concentration of Hydrocarbon Constituents in Water Based on Molar Solubility

Constituent	MW_F g/mol	C_{SAT} mg/L	MW_C g/mol	P_F g/mL	K_{FW}	C_F mg/L	C_W mg/L
Benzene	111.00	1,750	78	0.77	309.19	18,480.0	59.77
Toluene	111.00	535	92	0.77	1192.89	115,500.0	96.82
Ethylbenzene	111.00	152	106	0.77	4837.60	15,400.0	3.18
Xylene	111.00	198	106	0.77	3713.71	92,400.0	24.88
MTBE	111.00	48,000	88.15	0.77	12.74	67,375.0	5288.71
Naphthalene	111.00	33	128.2	0.77	26948.95	5,852.0	0.22

SITE 25, BUILDING 1346
ZONE F, CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA

DOMENICO'S DILUTION/ATTENUATION EQUATION FOR GROUNDWATER TRANSPORT

Predicted 10-year Migration of Constituents in Groundwater

Parameter Descriptions:	Units
POE = Point of Exposure	
SSTL = Site-Specific Target Level	mg/L
$SSTL_{SOURCE}$ = Hydrocarbon Concentration in Plume Source Area protective of RBSLs at POE	mg/L
$SSTL_{COMP}$ = Hydrocarbon Concentration at Compliance Point protective of RBSLs at POE	mg/L
X_{POE} = x = Distance from Plume Source to POE (along Centerline)	m
X_{COMP} = x = Distance from POE to Compliance Point (along Centerline)	m
Y = Source Width (Perpendicular to Flow Direction)	m
Z = Source Depth (Perpendicular to Flow Direction in Vertical Plane)	m
K_S = Saturated Hydraulic Conductivity	m/sec
i = Groundwater Gradient	cm/cm
θ = Porosity in Saturated Zone	cm^3/cm^3

Parameter Descriptions:	Units
ρ_S = Soil Bulk Density	g/cm^3
f_{OC} = Fraction Organic Carbon in Soil	g-C/g-soil
α_X = Longitudinal Dispersivity = x/10	m
α_Y = Transverse Dispersivity = $\alpha_X/3$	m
α_Z = Vertical Dispersivity = $\alpha_X/20$	m
k_{OC} = Organic Carbon Partition Coefficient	cm^3-H_2O/g-C
k_D = Soil-Water Sorption Coefficient	cm^3-H_2O/g-soil
V = Pore Water Velocity	m/sec
R_C = Constituent Retardation Factor	
V/R_C = Maximum Transport Rate of Dissolved Constituent = $(K_s i)/(\theta R_C)$	m/sec
RBSL = Risk-Based Screening Level in Water Provided by SCDHEC (1998)	mg/L

Dilution & Attenuation without Biological Decay

Constituent	X_{POE} ft	X_{POE} m	Y m	Z m	t sec	K_S m/sec	i m/m	θ cm^3/cm^3	ρ_S g/cm^3	α_X m	α_Y m	α_Z m	f_{OC} g-C/g-soil	k_{OC} cm^3-H_2O/g-C	k_D cm^3-H_2O/g-soil	V m/sec	R_C	C_{POE}/C_{SOURCE}
Benzene	202	61.5703	15	2	3.15E+08	2.47E-06	0.0096	0.36	1.73	6.16	2.05	0.31	6.16E-04	81	0.049896	6.59E-08	1.240	8.355E-05
Toluene	108	32.9188	15	2	3.15E+08	2.47E-06	0.0096	0.36	1.73	3.29	1.10	0.16	6.16E-04	133	0.081928	6.59E-08	1.394	9.799E-03
Ethylbenzene	56	17.069	15	2	3.15E+08	2.47E-06	0.0096	0.36	1.73	1.71	0.57	0.09	6.16E-04	176	0.108416	6.59E-08	1.521	2.134E-01
Xylenes	26.1	7.95538	15	2	3.15E+08	2.47E-06	0.0096	0.36	1.73	0.80	0.27	0.04	6.16E-04	639	0.393624	6.59E-08	2.892	4.047E-01
MTBE	287	87.4787	15	2	3.15E+08	2.47E-06	0.0096	0.36	1.73	8.75	2.92	0.44	6.16E-04	12	0.007392	6.59E-08	1.036	7.519E-06
Naphthalene	25.5	7.77249	15	2	3.15E+08	2.47E-06	0.0096	0.36	1.73	0.78	0.26	0.04	6.16E-04	1543	0.950488	6.59E-08	5.568	4.617E-02

Source: South Carolina Department of Health and Environmental Control (SCDHEC) 1998. *Risk-Based Corrective Action for Petroleum Releases*, Bureau of Underground Storage Tank Management.

DOMENICO DILUTION/ATTENUATION MODEL WITHOUT BIOLOGICAL DECAY

$$\frac{C_X}{C_{SOURCE}} = \frac{1}{2} erfc\left[\frac{\left(x - \frac{vt}{R_c}\right)}{2\sqrt{\alpha_X \frac{vt}{R_c}}}\right] \times erf\left[\frac{Y}{4\sqrt{\alpha_Y x}}\right] \times erf\left[\frac{Z}{2\sqrt{\alpha_Z x}}\right]$$

Constituent	C_{SOURCE} mg/L	C_X mg/L	RBSL mg/L
Benzene	59.77	0.005	0.005
Toluene	96.82	0.949	1.000
Ethylbenzene	3.18	0.679	0.700
Xylenes	24.88	10.069	10.000
MTBE	5288.71	0.040	0.040
Naphthalene	0.217	0.010	0.010

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DOMENICO'S DILUTION/ATTENUATION EQUATION FOR GROUNDWATER TRANSPORT

Predicted 20-year Migration of Constituents in Groundwater

Parameter Descriptions:	Units
POE = Point of Exposure	
SSTL = Site-Specific Target Level	mg/L
$SSTL_{SOURCE}$ = Hydrocarbon Concentration in Plume Source Area protective of RBSLs at POE	mg/L
$SSTL_{COMP}$ = Hydrocarbon Concentration at Compliance Point protective of RBSLs at POE	mg/L
X_{POE} = x = Distance from Plume Source to POE (along Centerline)	m
X_{COMP} = x = Distance from POE to Compliance Point (along Centerline)	m
Y = Source Width (Perpendicular to Flow Direction)	m
Z = Source Depth (Perpendicular to Flow Direction in Vertical Plane)	m
K_S = Saturated Hydraulic Conductivity	m/sec
i = Groundwater Gradient	cm/cm
θ = Porosity in Saturated Zone	cm^3/cm^3

Parameter Descriptions:	Units
ρ_S = Soil Bulk Density	g/cm^3
f_{OC} = Fraction Organic Carbon in Soil	g-C/g-soil
α_X = Longitudinal Dispersivity = x/10	m
α_Y = Transverse Dispersivity = $\alpha_X/3$	m
α_Z = Vertical Dispersivity = $\alpha_X/20$	m
k_{OC} = Organic Carbon Partition Coefficient	cm^3-H_2O/g-C
k_D = Soil-Water Sorption Coefficient	cm^3-H_2O/g-soil
V = Pore Water Velocity	m/sec
R_C = Constituent Retardation Factor	
V/R_C = Maximum Transport Rate of Dissolved Constituent = $(K_S i)/(\theta R_C)$	m/sec
RBSL = Risk-Based Screening Level in Water Provided by SCDHEC (1998)	mg/L

Dilution & Attenuation without Biological Decay

Constituent	X_{POE} ft	X_{POE} m	Y m	Z m	t sec	K_S m/sec	i m/m	θ cm^3/cm^3	ρ_S g/cm^3	α_X m	α_Y m	α_Z m	f_{OC} g-C/g-soil	k_{OC} cm^3-H_2O/g-C	k_D cm^3-H_2O/g-soil	V m/sec	R_C	C_{POE}/C_{SOURCE}
Benzene	355	108.205	15	2	6.31E+08	2.47E-06	0.0096	0.36	1.73	10.82	3.61	0.54	6.16E-04	81	0.049896	6.59E-08	1.240	8.597E-05
Toluene	159	48.4638	15	2	6.31E+08	2.47E-06	0.0096	0.36	1.73	4.85	1.62	0.24	9.78E-04	133	0.130074	6.59E-08	1.625	1.052E-02
Ethylbenzene	76.9	23.4394	15	2	6.31E+08	2.47E-06	0.0096	0.36	1.73	2.34	0.78	0.12	9.78E-04	176	0.172128	6.59E-08	1.827	2.251E-01
Xylenes	36.5	11.1253	15	2	6.31E+08	2.47E-06	0.0096	0.36	1.73	1.11	0.37	0.06	9.78E-04	639	0.624942	6.59E-08	4.003	4.029E-01
MTBE	507	154.535	15	2	6.31E+08	2.47E-06	0.0096	0.36	1.73	15.45	5.15	0.77	9.78E-04	12	0.011736	6.59E-08	1.056	7.300E-06
Naphthalene	34	10.3633	15	2	6.31E+08	2.47E-06	0.0096	0.36	1.73	1.04	0.35	0.05	9.78E-04	1543	1.509054	6.59E-08	8.252	4.661E-02

Source: South Carolina Department of Health and Environmental Control (SCDHEC) 1998. *Risk-Based Corrective Action for Petroleum Releases*, Bureau of Underground Storage Tank Management.

DOMENICO DILUTION/ATTENUATION MODEL WITHOUT BIOLOGICAL DECAY

$$\frac{C_X}{C_{SOURCE}} = \frac{1}{2} erfc\left[\frac{\left(x - \frac{vt}{R_c}\right)}{2\sqrt{\alpha_X \frac{vt}{R_c}}}\right] \times erf\left[\frac{Y}{4\sqrt{\alpha_Y x}}\right] \times erf\left[\frac{Z}{2\sqrt{\alpha_Z x}}\right]$$

Constituent	C_{SOURCE} mg/L	C_X mg/L	RBSL mg/L
Benzene	60	0.005	0.005
Toluene	97	1.019	1.000
Ethylbenzene	3	0.716	0.700
Xylenes	25	10.023	10.000
MTBE	5289	0.039	0.040
Naphthalene	0.217	0.010	0.010

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